ENGINEERING NEWS-RECORD

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ASCE's Brooks Earnest: We're falling behind p.54

STEVENS RICE GS N
UNIV MICROFILMS INC
313 N FIRST ST
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A McGRAW-HILL PUBLICATION

HORTONCLAD® Again Combats Corrosion for Less Money

CHICAGO
CB&I
BRIDGE

Hortonclad is the registered trade mark for vacuum clad plates developed by Chicago Bridge & Iron Company.

CB-6124

To combat corrosion, with economy, CB&I's Hortonclad was selected for this 17-foot diameter reactor for a petroleum catalytic reforming unit. It is one of five fabricated for Shell Oil Company's Wood River, Ill. refinery supplied through Arthur G. McKee Company.

Hortonclad, produced by a special CB&I process, provides the same benefits as solid corrosion-resistant material at substantially less cost. The 3.65" thick plate used in this reactor, for example, consists of ¼" Type 405 stainless clad to carbon steel.

A wide selection of cladding and backing materials, fully meeting or exceeding ASME and ASTM specifications, is available.

Look into the cost advantages of equipment fabricated of Hortonclad for your next job. Write for Bulletin G-43. Chicago Bridge & Iron Company, 332 S. Michigan Ave., Chicago 4, Illinois. Offices and subsidiaries throughout the world.

Only CB&I Vacuum Bonds Clad Plates

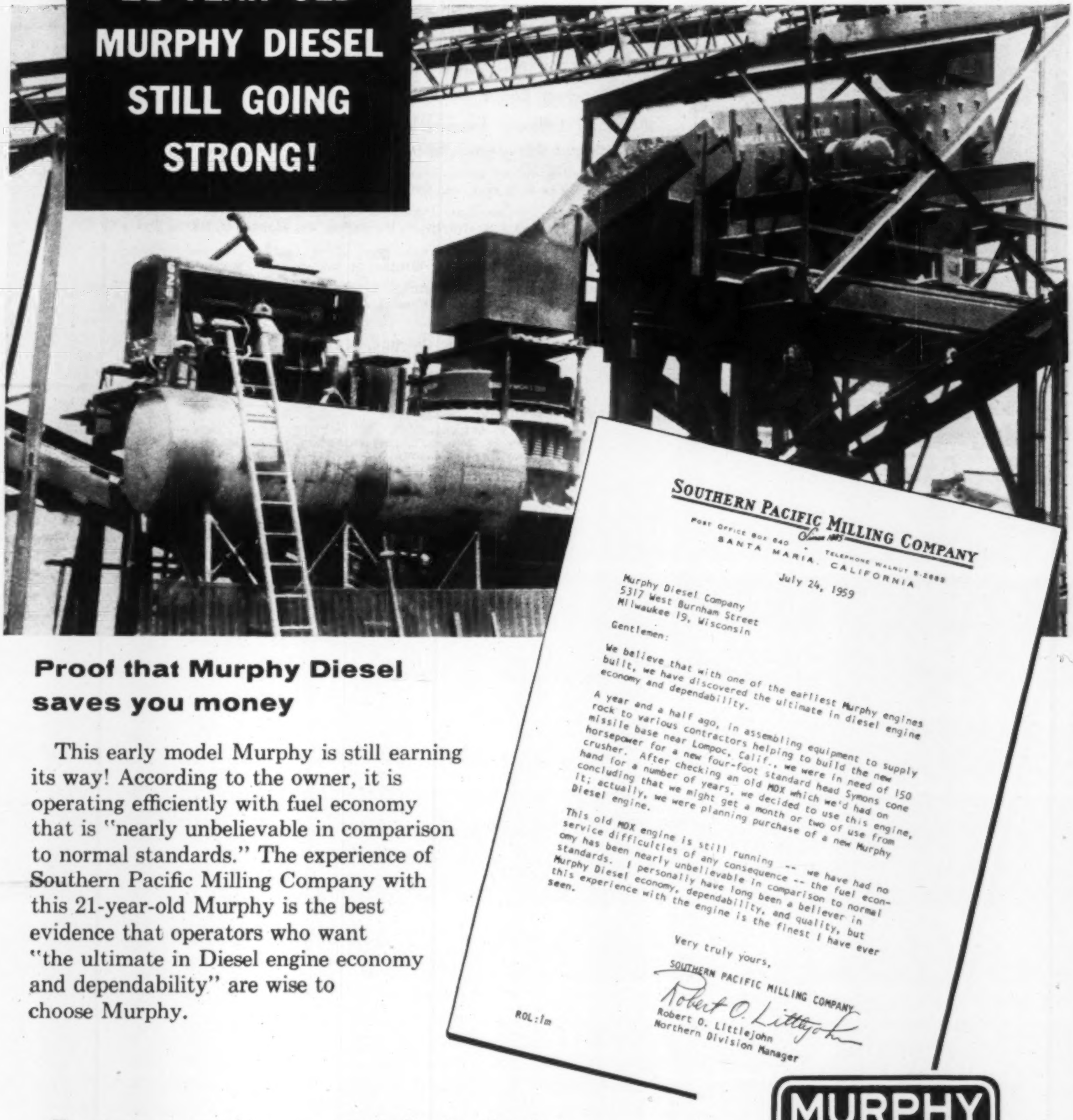
Hortonclad, available only in CB&I-fabricated vessels and other clad structures, is a composite metal having an integral and continuous bond produced by a high vacuum bonding process.

- **Thickness remains unchanged.**
- **Harmful gases are excluded.**
- **Clean, strong uniform bond is produced.**
- **High quality finish is maintained.**

This is why Hortonclad is superior to ordinary cladded metals for corrosion resistance and design economy.

An exclusive CB&I **development**

21 YEAR OLD MURPHY DIESEL STILL GOING STRONG!



SOUTHERN PACIFIC MILLING COMPANY
Since 1885
POST OFFICE BOX 640 • TELEPHONE WALNUT 5-2089
SANTA MARIA, CALIFORNIA

July 24, 1959

Murphy Diesel Company
5317 West Burnham Street
Milwaukee 19, Wisconsin

Gentlemen:

We believe that with one of the earliest Murphy engines built, we have discovered the ultimate in diesel engine economy and dependability.

A year and a half ago, in assembling equipment to supply rock to various contractors helping to build the new missile base near Lompoc, Calif., we were in need of 150 horsepower for a new four-foot standard head Symons cone crusher. After checking an old MDX which we'd had on hand for a number of years, we decided to use this engine, concluding that we might get a month or two of use from it; actually, we were planning purchase of a new Murphy Diesel engine.

This old MDX engine is still running -- we have had no service difficulties of any consequence -- the fuel economy has been nearly unbelievable in comparison to normal standards. I personally have long been a believer in Murphy Diesel economy, dependability, and quality, but this experience with the engine is the finest I have ever seen.

Very truly yours,

SOUTHERN PACIFIC MILLING COMPANY

Robert O. Littlejohn

Robert O. Littlejohn
Northern Division Manager

ROL:lm

Proof that Murphy Diesel saves you money

This early model Murphy is still earning its way! According to the owner, it is operating efficiently with fuel economy that is "nearly unbelievable in comparison to normal standards." The experience of Southern Pacific Milling Company with this 21-year-old Murphy is the best evidence that operators who want "the ultimate in Diesel engine economy and dependability" are wise to choose Murphy.

Twenty-one years of improvement in diesel engine design and construction make today's Murphy Diesel first choice for always-dependable, low-cost operation.

418N

MURPHY DIESEL

HEAVY-DUTY POWER FOR CONSTRUCTION

Murphy Diesel engines and power units are available in sizes from 105 to 420 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 70 to 227 K.W.

MURPHY DIESEL COMPANY

5321 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

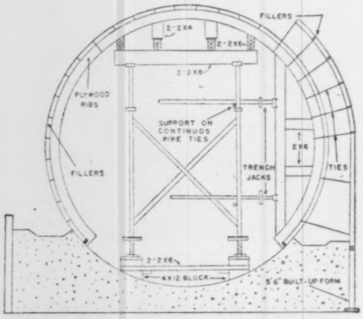
Throughout the Nation

60 minutes!

Strip, move, position 32′ gang form section in just one hour . . .

National Engineering and Contracting Co., Cleveland, relied on Symons steel-ply forms to pour a huge quarter mile sewer.

The $400,000 sewer is 13 feet in diameter and 15 inches thick. To meet the 3½ month contract deadline, the inside was formed with three sets of jumbo-mounted Symons forms similar to a gang section. These "jumbos" had hinged ribs and rode on plank rails. Each section was 32′ long and was constructed with 12 inch by 8 foot Symons steel-ply fillers. Workmen were able to strip, move a section 30 feet and re-position in one hour. Symons new gang-form bolt simplified assembling and stripping by allowing the ties to be broken back before moving the sections.



Cross section showing construction features of jumbo form. Workmen, with a block and tackle manually pulled the "jumbo" 30 ft ahead for the next pour.

For the *complete story, write us.* Ask also about our free engineering service . . . rental-purchase options . . . and complete line catalog.

Symons

SYMONS CLAMP & MFG. CO.
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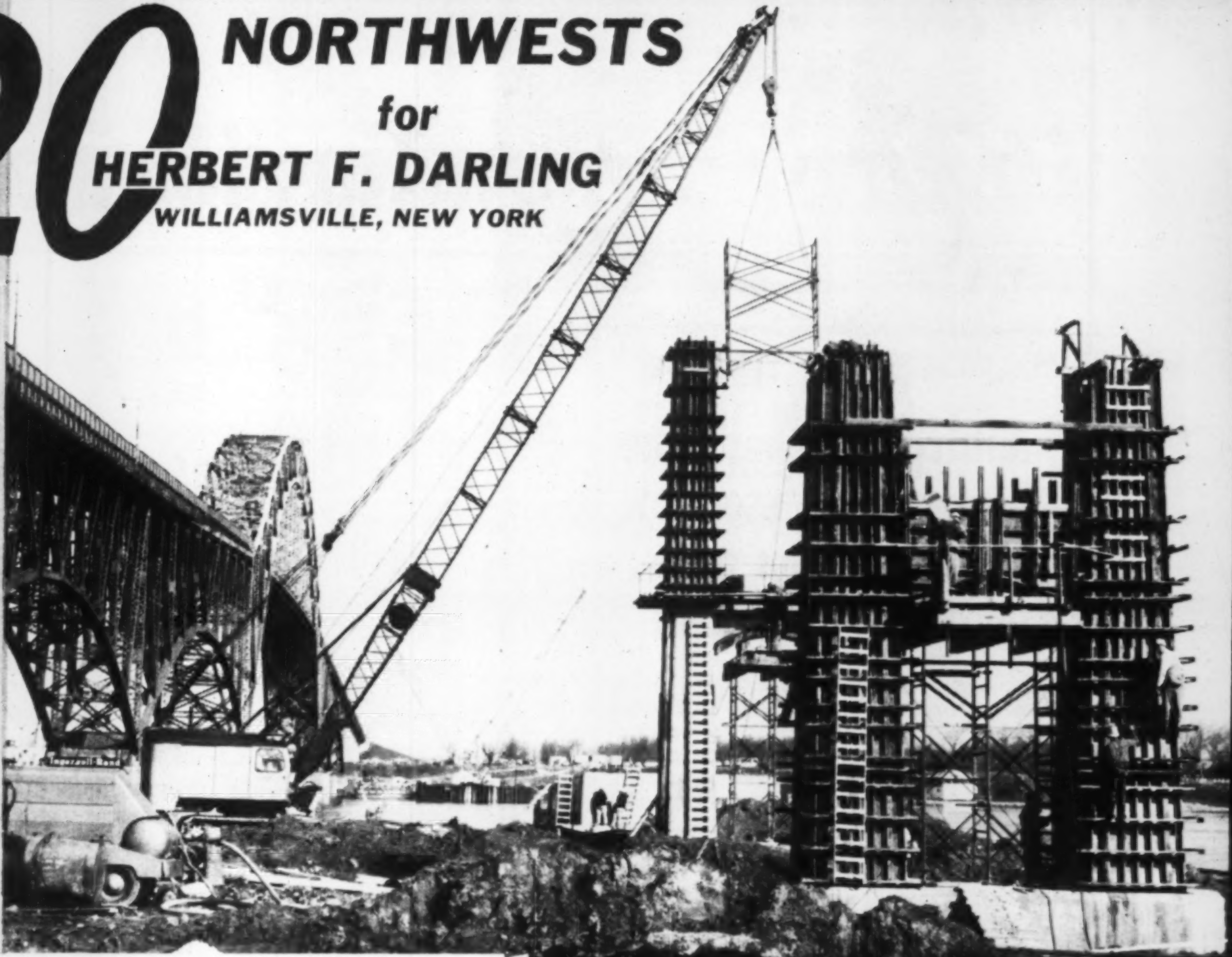
20 NORTHWESTS for HERBERT F. DARLING

WILLIAMSVILLE, NEW YORK



UNPOSED PHOTOGRAPHS OF NORTHWESTS DOING A JOB

NO one knows more about the features required in a crane to fit it for all around work than Herbert F. Darling of Williamsville, N. Y. Pictured is his big bridge job at Tonawanda, N. Y. This is the new bridge to Grand Island, which will parallel the old bridge in the background. Three Northwests are on the job, a 95, shown swinging a piece of scaffold into place, a Model 6, and a 25-D. These machines handled the footings and the lifts to the great piers.

Two new Northwests purchased in 1961, make 20 Northwests that Herbert F. Darling Co. has bought—19 repeat orders that tell the real story of Northwest performance.

Here are machines that give you the smooth, easily controlled swing that is inherent in the Northwest Uniform Pressure Swing Clutches. They give you the Feather-Touch Clutch Control with the "feel" of the load. They give you a really *dependable* Independent High-Speed Boom Hoist, power-controlled, up or down—a unit that won't heat or fade. Add to this, the many other Northwest crane advantages—a range of crawler widths and lengths, Differential or Block & Skid Steering, removable Counterweight, 3rd Drums, Boom Struts, Sectional Jibs, Torque Converters — whatever you need for the crane job! Here is a combination that means greater safety and flexibility on a wider range of work with either long or short booms.

NORTHWEST

CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

3/4 to 4-1/2 Cu. Yd. Capacity

NORTHWEST ENGINEERING COMPANY
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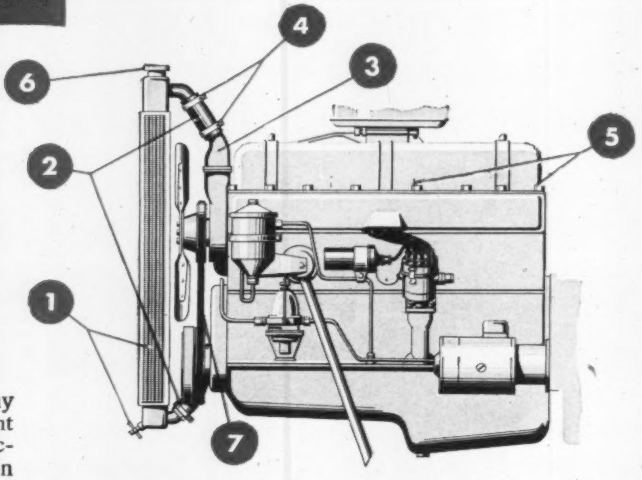
G-44-LC

LUBE LOGIC Tips for more



Antifreeze: what's the best type to use; how to make sure you get maximum protection

It's getting pretty close to antifreeze weather in many parts of the country, which brings up two important points: choosing the best type of antifreeze for construction machinery; and making sure the cooling system is in good condition, so the antifreeze can do its job properly.

The right type of antifreeze is the permanent kind. Construction equipment engines operate best at 180°F jacket temperature which is ten degrees higher than the boil-off point for alcohol. Permanent antifreeze (like Texaco Startex) will stay on the job at the temperature that's best for the engine. *Don't* substitute salt or kerosine solutions. They won't freeze, true enough, but they're tough on engine components.

It's important to keep the cooling system in good shape for three reasons: first, because antifreeze that gets into the crankcase causes severe varnish deposits on pistons and rings; second, because you want the antifreeze solution to circulate properly; and third, because antifreeze lost through a leak costs a lot more to replace than just plain water. Before you add antifreeze, check the following points:

1 Clean the cooling system—drain and flush thoroughly.
2 Check the radiator hoses, replace any that are soggy or collapsed.
3 Check the thermostat. If the thermostat is in good condition, the thermostat discharge connection will remain closed until the coolant in the water jacket is up to operating temperature.
4 Tighten connections on hoses that don't need replacing. Antifreeze can pass through spaces too small for water leaks.
5 Tighten cylinder head, oil cooler and other hold-down bolts.
6 Check radiator filler cap gasket.
7 Inspect and adjust fan belt.
8 Now you're ready to put in the antifreeze.

After the antifreeze is in, it's a good idea to:

1 Check the level at operating temperature.
2 Check for leaks.
3 Check water pump packing nut adjustment.
4 Check cooling solution with suitable hydrometer to make sure of protection temperature.

Metal concrete forms can be readied for re-use faster

You can get metal concrete forms cleaned up and back on the job faster if you spray them, before use, with Texaco Stazon. Use the Stazon just as it comes from the container for best results. Field reports say it gives the concrete a fine smooth finish, and the Stazon prevents sticking, shortens clean-up manhours.

Magneto Lubrication: three *IF*s and a *BUT*

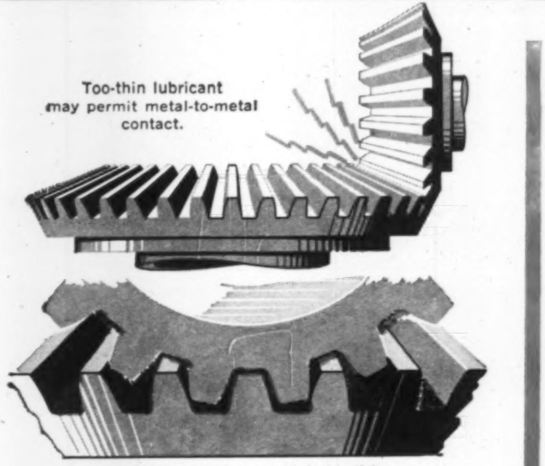
IF the magneto is oil-lubricated, apply a few drops of oil every 500 hours.

IF the magneto is grease lubricated, apply Texaco Marfak Multi Purpose 2 every 100 hours.

IF the magneto is located near the engine exhaust pipe, lubricate with Texaco High Temp Grease every 50 hours.

BUT if the bearings on your magneto are *sealed*, follow manufacturer's recommendations and let the distributor do the servicing.

efficient equipment performance


Too-thin lubricant may permit metal-to-metal contact.

Too-thick lubricant will hold dirt, pack in gear teeth, may damage bearings.

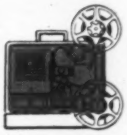
Key points in choosing gear lubricant for gyratory crushers

One of the toughest lube jobs on a gear-driven gyratory crusher is the gears themselves. They're partly protected by oil-tight cases and dust rings, but some contamination is inevitable, and it's essential that you choose a lubricant that can take it.

Viscosity is very important. These gears are very heavily loaded, so too-low viscosity may not provide a film thick enough to prevent metal to metal contact. On the other hand, if the lubricant is too thick, it will hold grit and dust in suspension, and let it develop a scoring action on the gear teeth. In addition, dust tends to dry out lubricants, and also creates a "packing" condition between gear teeth. This packing of dust and dried lubricant can build up undue pressure on gears and bearings.

Your best bet is a lubricant with a viscosity between 50 and 160 seconds Saybolt Universal at 210°F, with extreme pressure characteristics. These specifications will get you a lubricant with a good compromise between too thick and too thin. Ask any Texaco Lubrication Engineer to help you pick the right grade for your temperature zone.

TEXACO PRESENTS THREE NEW FILMS TO HELP BOOST YOUR PROFITS



1. PLAN FOR PROFIT—Texaco's newest color-and-sound movie. Dramatizes the major savings you can make with the proper investment of less than 1% of your total budget—the amount you spend on lubricants. Film features latest lubrication methods and equipment on a number of contracting projects, demonstrating the Texaco Simplified Lubrication Plan in action.

2. FUNDAMENTALS OF LUBRICATION—a brand new Texaco color slide film. A clear, concise once-over that defines technical terms like "viscosity" and explains specifically what lubrication is and what it does. This down-to-earth discussion will give the lubrication man a new understanding of the importance of lubrication, and a fresh interest in his work. It's supplemented with a manual that covers the same ground in greater detail.

3. LUBRICATION OF EARTHMOVING EQUIPMENT—a new slide film, in color. A concise, easy-to-understand analysis of proper lubrication of engines, wheel bearings, steering, track rollers, crawler treads, hydraulic equipment, wire rope, open and enclosed gears. Supplemented with a manual that covers the whole field of earthmoving equipment lubrication in greater detail.

FOR AN EARLY SHOWING of any one of these films—or all of them—contact your Texaco Contractor Representative *now.*

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in time and money can be made. If Lube Logic doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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TEXACO

Throughout the United States
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15 ways to save

The king of the long span is also the economy ace in short span bridge construction, particularly in view of recent developments involving design, materials, and methods. A new grade of steel, new steel sections, new design ideas, broader applications of tried and true auxiliary details—in all, a total of 15 opportunities for a bridge designer to reduce the cost of a structure, to build more bridges within his budget, without the least sacrifice in quality.

Design your next short span project in steel, applying these recent developments to the optimum. You'll be pleasantly surprised at the cost.

Write for our free booklet, "36 Ideas for Tomorrow's Short-Span Bridges."

USS is a registered trademark

1. Specify new ASTM-A36 steel instead of ASTM-A7 for main structural supports in spans of 20′ and longer. ASTM-A36 offers 10% more allowable stress, so it cuts weight about 6%, cuts costs from 3%-5%.

2. Replace conventional ASTM-A373 with ASTM-A36 for better weldability and save \$2-\$6 a ton.

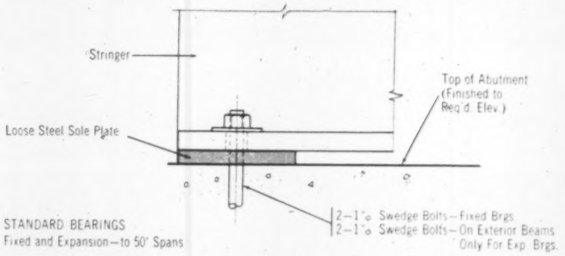
3. Where the new lightweight wide flange sections can be used in place of former minimum sections, weight reduction of about 10% can be achieved in beam spans.

4. Use all-welded construction to simplify detail, reduce weight and cut fabrication cost through the elimination of riveted or bolted attachment of stiffeners, diaphragms and shop splice material.

5. Design for composite beam and slab action in spans over 50′ to reduce weight and cost. The shallower floors provide greater underpass clearance, lessen approach embankment costs and reduce structural steel weight as much as 30%.

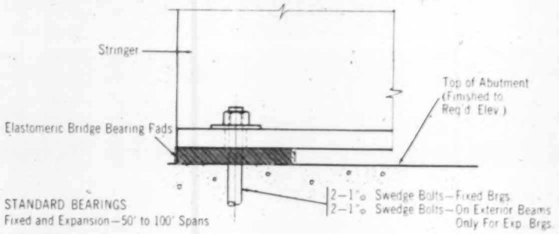
6. Replace long series of heavy simple spans with more efficient continuous spans and save 15%-30% and more in weight. Use the AISC publication, "Moments, Shears and Reactions, Continuous Highway Bridge Tables" (AIA File No. 13-C) to save design time.

7. Simple steel shoes for spans up to 50′. For low bearing pressures where deflection is not a problem, use simple steel plate for both sole and masonry plate at both fixed and expansion ends on spans up to 50′.


Stringer
Top of Abutment (Finished to Req'd. Elev.)
Loose Steel Sole Plate
2—1"⌀ Swedge Bolts—Fixed Brgs
2—1"⌀ Swedge Bolts—On Exterior Beams Only For Exp. Brgs.

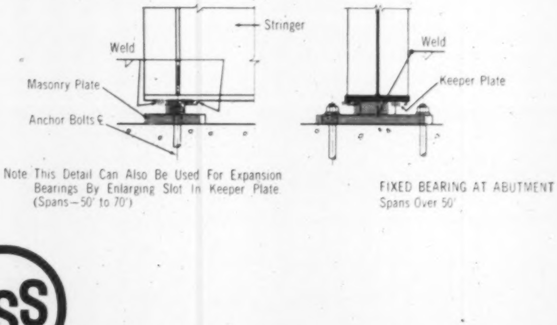
STANDARD BEARINGS
Fixed and Expansion—to 50′ Spans

8. Simple elastomeric shoes for spans up to 100′. Specify elastomeric pads for bridge shoes on spans up to 100′ to cut costs considerably.


Stringer
Top of Abutment (Finished to Req'd. Elev.)
Elastomeric Bridge Bearing Pads
2—1"⌀ Swedge Bolts—Fixed Brgs
2—1"⌀ Swedge Bolts—On Exterior Beams Only For Exp. Brgs.

STANDARD BEARINGS
Fixed and Expansion—50′ to 100′ Spans

9. Fixed bearing plates for spans over 50′. Use fixed bearings with a combination masonry plate and rocker for spans of 50′ to 100′ where metallic shoes are preferred and deflection is a problem. A wide slot in the keeper plate will provide an adequate expansion bearing for spans of 50′ to 70′.


Stringer
Weld
Masonry Plate
Anchor Bolts
Weld
Keeper Plate

Note This Detail Can Also Be Used For Expansion Bearings By Enlarging Slot In Keeper Plate (Spans—50′ to 70′)

FIXED BEARING AT ABUTMENT
Spans Over 50′

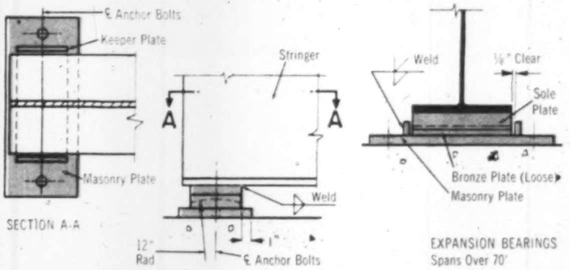
General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge · Atlanta · Baltimore · Birmingham · Boston · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Elmira · Gary · Harrisburg, Pa. · Houston · Los Angeles · Memphis · Minneapolis · New York · Orange, Texas · Philadelphia · Pittsburgh · Portland, Ore. · Roanoke · St. Louis · San Francisco · Trenton · United States Steel Export Company, New York

American Bridge
Division of
United States Steel

USS

money on short span bridges

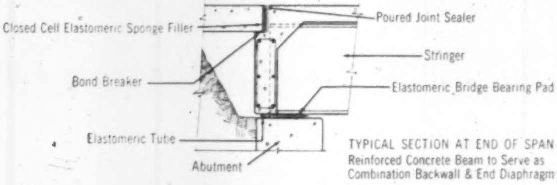
10. Sliding bronze expansion plates for spans over 70′. Specify bronze sliding rocker plates for economical expansion bearings on spans over 70′. Keeper bars need be placed only at the sides to prevent lateral movement.


℄ Anchor Bolts
Keeper Plate
Masonry Plate
Stringer
A
A
Weld
12" Rad
1"
℄ Anchor Bolts
Weld
⅛" Clear
Sole Plate
Bronze Plate (Loose)
Masonry Plate

SECTION A-A

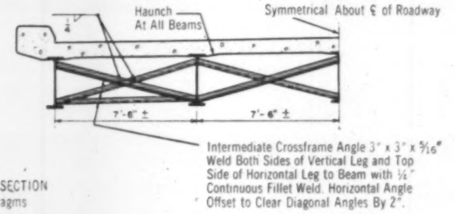
EXPANSION BEARINGS
Spans Over 70′

11. Eliminate structural diaphragms and backwalls at abutments. Use concrete diaphragms to provide support for approach slabs, and to replace conventional abutment backwall. Closed cell elastomeric sponge filler and point joint sealer replace costly expansion dams.


Closed Cell Elastomeric Sponge Filler
Poured Joint Sealer
Stringer
Bond Breaker
Elastomeric Bridge Bearing Pad
Elastomeric Tube
Abutment

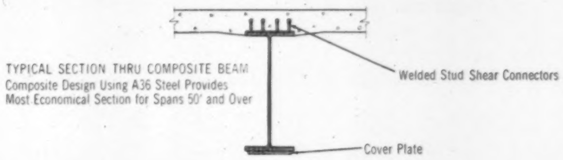
TYPICAL SECTION AT END OF SPAN
Reinforced Concrete Beam to Serve as Combination Backwall & End Diaphragm

12. Welded angle diaphragms lead to simplification. Use panels welded directly to the webs of stringers for simple transverse bracing. Note the absence of top struts and use of a bottom strut only in outer panel.


Haunch At All Beams
Symmetrical About ℄ of Roadway
¼
7′-6″ ±
7′-6″ ±
Intermediate Crossframe Angle 3″ x 3″ x 5/16″ Weld Both Sides of Vertical Leg and Top Side of Horizontal Leg to Beam with ¼″ Continuous Fillet Weld. Horizontal Angle Offset to Clear Diagonal Angles By 2″.

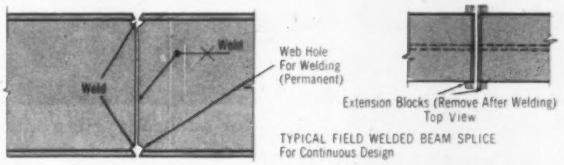
HALF TRANSVERSE SECTION
Welded Angle Diaphragms

13. Welded stud shear connectors simplify fabrication. Use welded stud type shear connectors for composite design to facilitate shop and field assembly. Keep studs to a minimum, by using largest size studs.


Welded Stud Shear Connectors
Cover Plate

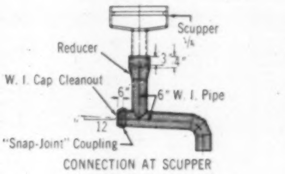
TYPICAL SECTION THRU COMPOSITE BEAM
Composite Design Using A36 Steel Provides Most Economical Section for Spans 50′ and Over

14. Use welded field splices to cut costs. Use welded field splices for fabrication and erection economy when all other field connections are welded as suggested under item 4.

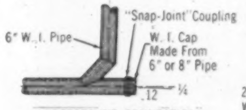

Weld
Weld
Web Hole For Welding (Permanent)
Extension Blocks (Remove After Welding)
Top View

TYPICAL FIELD WELDED BEAM SPLICE
For Continuous Design

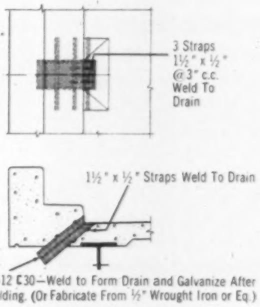
15. Welded drainage details simplify design and eliminate expensive castings. Use combination scuppers and conduits for drains not requiring connection to sewers. Use wrought iron pipe with corrosion-resistant weldments for scuppers for larger drains connected to sewers. Note the use of "snap-joint" couplings for easy removal for cleaning.


Scupper
¼
Reducer
3¼"
W. I. Cap Cleanout
6"
6" W. I. Pipe
12
"Snap-Joint" Coupling

CONNECTION AT SCUPPER

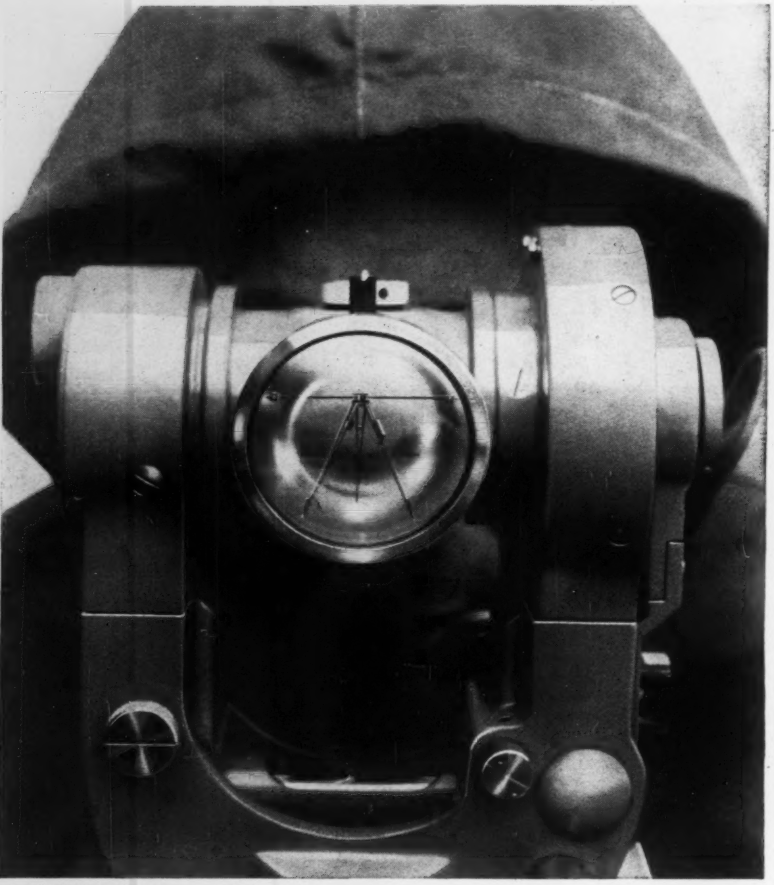

"Snap-Joint" Coupling
6" W. I. Pipe
W. I. Cap Made From 6" or 8" Pipe
12
¼

UNDERGROUND CONNECTION
DRAIN PIPE DETAIL


3 Straps 1½" x ½" @ 3" c.c. Weld To Drain
1½" x ½" Straps Weld To Drain
2—12 ⊏30—Weld to Form Drain and Galvanize After Welding. (Or Fabricate From ½" Wrought Iron or Eq.)

SCUPPER DETAIL

This mark tells you a product is made of modern, dependable Steel.



THE UNIVERSAL STANDARD for accuracy, ruggedness and speed of operation. With readings direct to one second, the instrument is ideal for triangulation and laboratory use. AVAILABLE WITH A COMPLETE RANGE OF ACCESSORIES... Invar Subtense Bar, Diagonal Eyepiece Set, Pentagonal Objective Prism, and Autocollimation Eyepiece.

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Reader Comment

Don't Toss Them Out

SIR—Most engineers read many technical publications each month. They clip and file certain material and the remainder heads for the trash basket. What a waste of good literature, especially when one realizes the low level of technical education throughout the under-developed countries of the world.

A recent copy of the ENGINEERING NEWS-RECORD weighed just five ounces. It may be sent overseas at a cost of only eleven cents. Monthly magazines may be mailed for less than twenty-five cents. That is a small price for assisting in the "peace race."

Those interested might start by mailing a single magazine each month to a small, private engineering college in either India or Kenya. Just address Librarian, Manipal Engineering College, Manipal, South India (Mysore State), or Royal College, Nairobi, Kenya.

Or send publications to other such suitable recipients.

HUBERT R. O'REILLY
New York, N. Y.

Right Flood, Wrong City

SIR—Are you sure that your picture captioned "Water came from the bay to flood downtown Galveston" is really of Galveston (ENR Sept. 21, p. 43)?

If I am not mistaken, it looks more like the intersection of 85th St. with the Blue River and Highway 71 in Kansas City.

HILDRETH L. STONG
Butler Mfg. Co.
Kansas City, Mo.

Editor's Note—Mr. Stong makes no mistake in identifying his home town, even though two captions on the page were mistakenly switched.

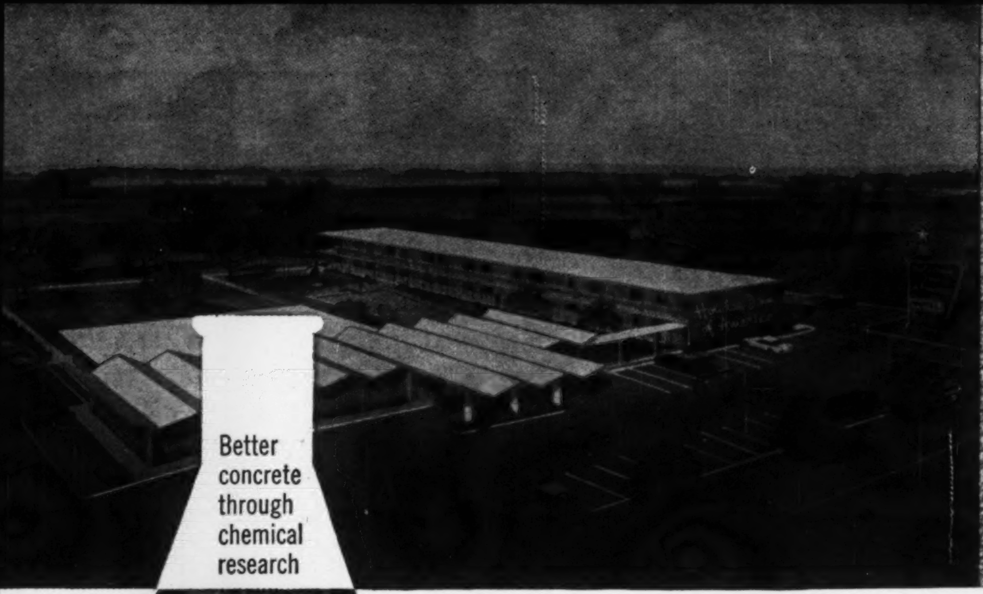
Wider Width, Too

SIR—We appreciate very much your write-up of our steel grating catalog Wider Width, Too (ENR Sept. 21, p. 178). However, your statement that over-all panel widths go to 23⅞ in. is somewhat misleading, for actually this is only one standard. We also go to 36 in.

D. G. GOODWIN
Kerrigan Iron Works Company
Nashville, Tennessee

(Reader comment continued p. 12)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.


Better concrete through chemical research

WRDA

WATER REDUCING ADMIXTURE

on the job for

HOLIDAY INNS OF AMERICA, at Wilmington, Delaware

Latest link in the well-known chain of Holiday Inns of America, Inc., this $700,000, 60-unit motel recently opened for business in Wilmington, Delaware. Featuring all modern conveniences for guests' comfort and pleasure, the attractive structure was completed in just ten months' time.

Marking the first folded plate roof slab construction in the state, the job presented a tricky concreting problem. Roof design's 26° pitch meant the mix had to have exactly the right combination of good workability and low enough slump to permit placement of the concrete under these exacting conditions.

WRDA, Dewey and Almy's water reducing *liquid* admixture got the call. It provided all the plasticity needed for easy placement with low slump concrete; saved on finishing costs besides. Dewey and Almy AEA *liquid* air entraining admixture was also used to improve workability and protect roof sections for maximum freeze-thaw resistance.

SPONSOR: Thomas C. Marshall, Inc., Wilmington, Delaware; ARCHITECT: William Bond, Memphis, Tennessee; ENGINEERS: George B. Jett & Associates, Memphis, Tenn.; CONTRACTOR: W. D. Haddock Construction Co., Wilmington, Del.; READY-MIX SUPPLIER: Warner Co., Wilmington, Del.; ADMIXTURE SALES AND TECHNICAL SERVICE: Admixtures, Inc., Upper Darby, Pa.

DEWEY AND ALMY CHEMICAL ADMIXTURES FOR CONCRETE CONTROL

Research Perfected—Proved in Use

DAREX AEA

provides controlled air entrainment, greater durability.

WRDA

controls water content.

DARATARD

controls retardation of initial set.

Catalog 9/DE in
Sweet's Architectural File

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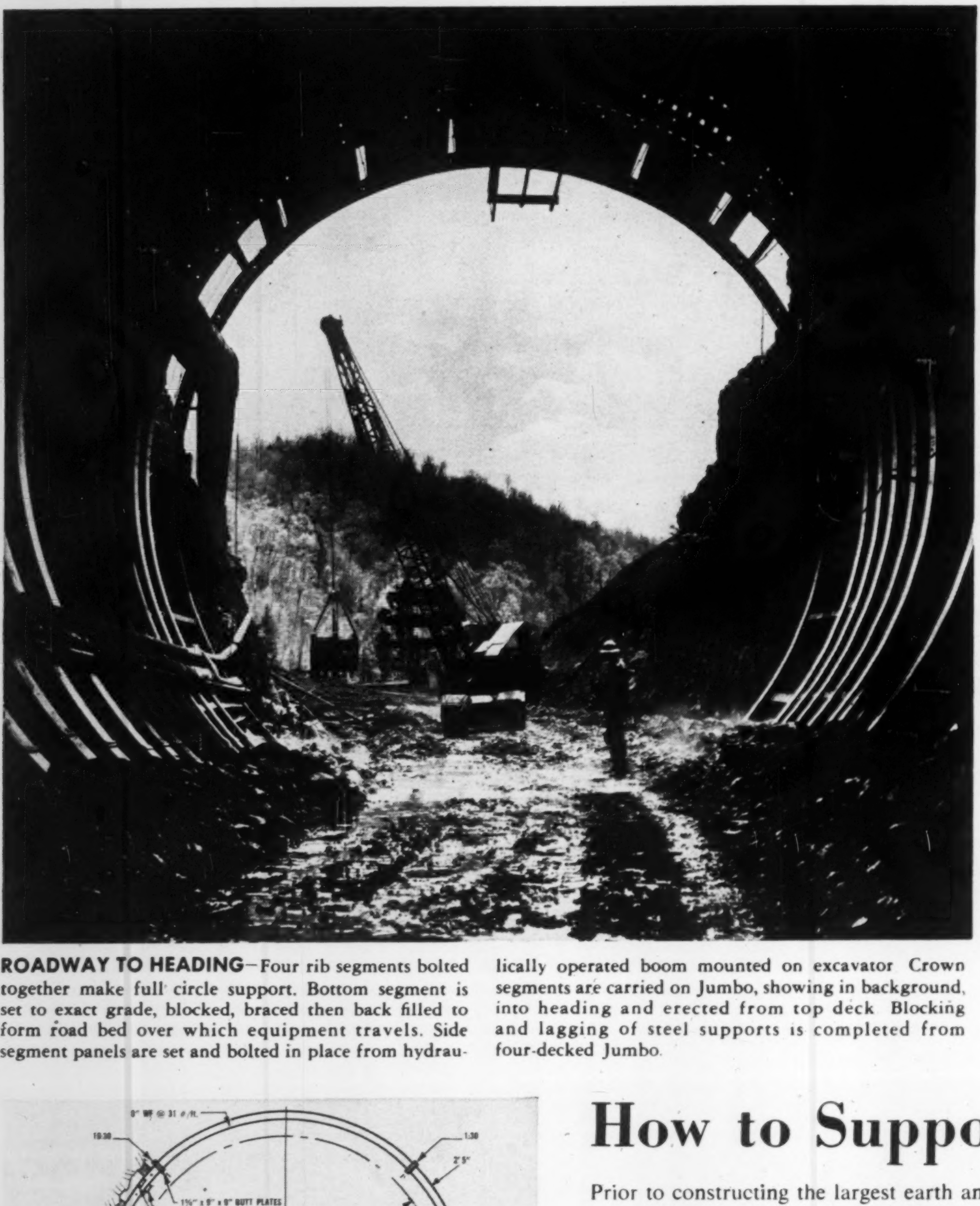
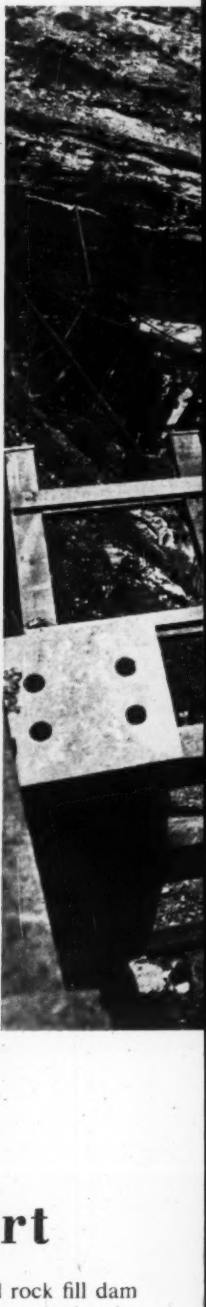
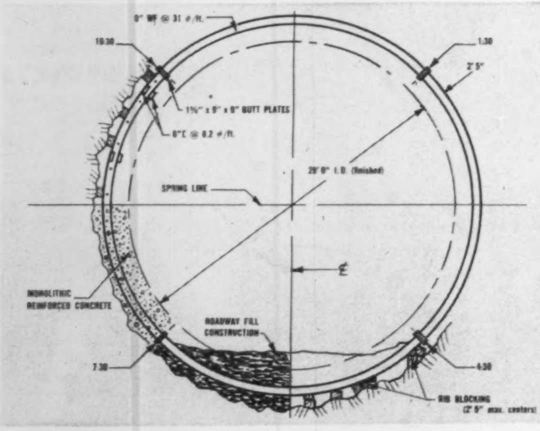




ROADWAY TO HEADING—Four rib segments bolted together make full circle support. Bottom segment is set to exact grade, blocked, braced then back filled to form road bed over which equipment travels. Side segment panels are set and bolted in place from hydraulically operated boom mounted on excavator. Crown segments are carried on Jumbo, showing in background, into heading and erected from top deck. Blocking and lagging of steel supports is completed from four-decked Jumbo.

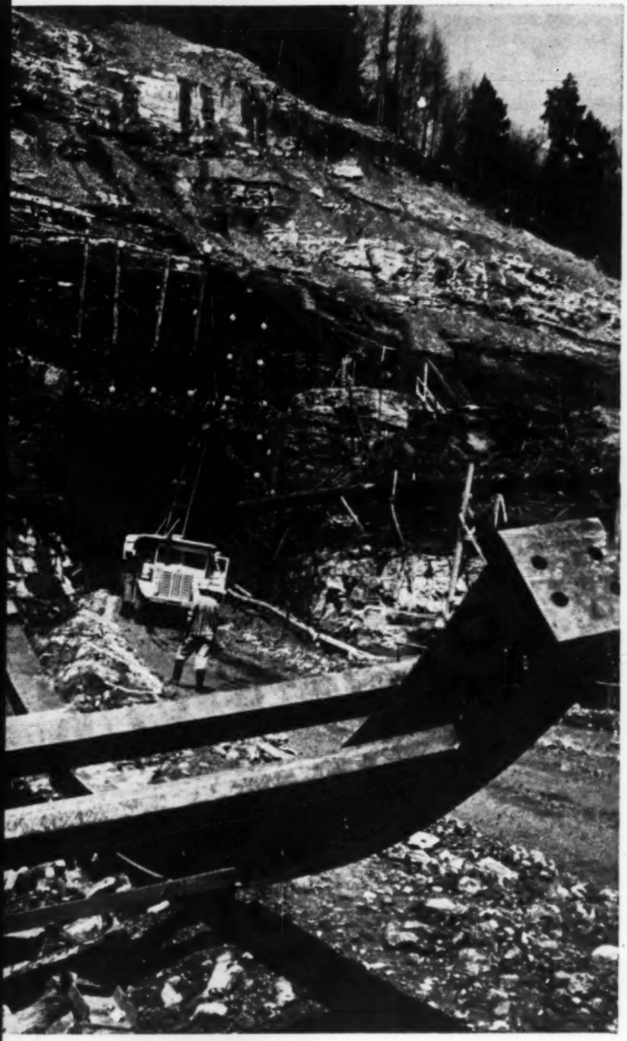

8" WF @ 31 #/ft.
10:30
1:30
2'5"
1¾" x 9" x 9" BUTT PLATES
6"[@ 8.2 #/ft.
29' 0" I.D. (finished)
SPRING LINE
℄
MONOLITHIC REINFORCED CONCRETE
ROADWAY FILL CONSTRUCTION
7:30
4:30
RIB BLOCKING (2' 6" max. centers)

TUNNEL LINING DETAIL—Four piece rib sets, joined by bolting butt plates at 1:30, 4:30, 7:30 and 10:30 form full circle structural steel support for 35 ft. diameter tunnel bore.

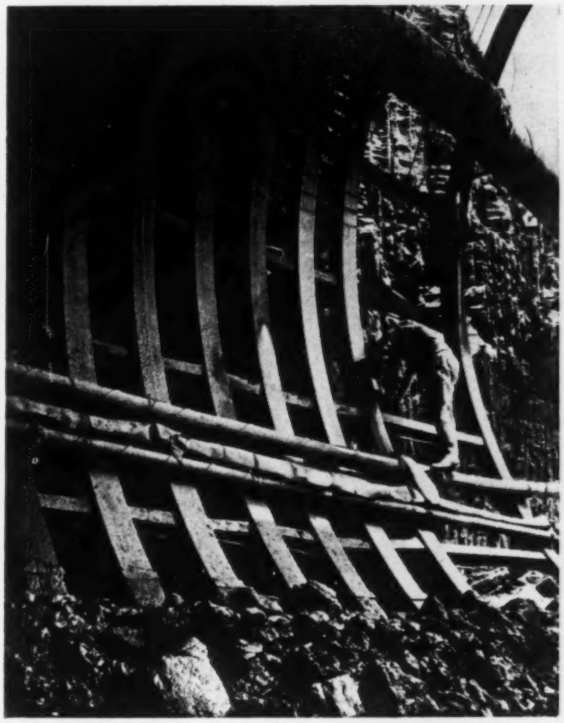
How to Support

Prior to constructing the largest earth and rock fill dam east of the Mississippi, a tunnel 1900 ft. long had to be driven to divert the flow of the Gauley River. Summerville Reservoir Project, under the jurisdiction of the Huntington District, U. S. Army Corps of Engineers, will be important in the over-all flood control program for the Kanawha Valley.

By driving the tunnel from both portals concurrently a unique "double teamed" work cycle was employed that kept the job on an 8 hour shift schedule around the clock. One shift drilled the face, loaded the 175 holes for blasting, removed the Jumbo and shot the heading. Another shift wet down the muck, scaled the roof, mucked the heading, set and back filled the bottom steel support segments. Finally the third shift set the side steel support segments, moved the Jumbo in, erected the top steel



MULTIPLE SEGMENT ASSEMBLY – Job site assembly of rib segments into panels of 2, 3 or 4 ribs speeded erection. 6" structural channels welded to flanges of ribs also served as spacers. Four quick acting bolts join rib butt plates.



EXACTING GRADE AND LINE – Specifications called for deviation not in excess of plus or minus 2" from theoretical grade and line. Ribs had to be accurately bent full length to true radius and be free of camber.

Summerville Reservoir Project
Diversion Tunnel and Outlet Work
General Contractor:
J. A. Jones Construction Company, Charlotte, N. C.
Jack Kabrick, Project Manager
Tunnel Contractor:
Mountain State Construction Co., Spring Hill, W Va.
James Vesser, Supt

35 ft. Diameter Tunnel Driven Full Face

segments, braced, blocked and lagged between the steel supports and the rough tunnel bore. By staggering the cycles of the operation, crews trained for each phase of the work were used in both headings. Equipment was in continuous use.

Drilling full face into the heading as deep as 16 ft. for a single shot resulted in draws up to 15 ft. Progress in the two faces of the 35 ft. diameter bore reached as much as 152 ft. in a six day week. Tunnel support was necessary because of the sandstone, shale and soft coal encountered in driving this tunnel.

The contractor needed tunnel supports which could be erected fast. That is why he chose COMMERCIAL steel ribs for the entire project—full circle support with 8" WF beams spaced on 4 ft. centers. A method of pre-assembling rib segments prior to erection was an innovation the contractor used. It paid off in faster steel erection needed to keep up with the high rate of progress.

Result: The tunnel was holed through on schedule with an enviable safety record.

FOR COMPLETE INFORMATION involving support for tunnels, vertical shaft, or open pits, COMMERCIAL'S engineering counsel is yours for the asking. Address: Commercial Shearing & Stamping Company, Youngstown 1, Ohio. Attention: Department E-43

COMMERCIAL
shearing & stamping

New 2½ c/y **PAYLOADER**®

"has everything"

The advanced design and exclusive operating features of the new H-70 series "C" PAYLOADER model are the result of refinements originally introduced in the H-30 and H-120 units that have been so well received. Those items that contributed most to the unmatched performance of these machines served as a guide for the development of this new 2½ cu. yd. tractor-shovel. Some of its features are:

More Power and Capacity: New diesel engine of 148 hp., an increase of 20% over previous model. 25% increase in standard bucket, from 2 to 2½ cu. yds. (SAE rated). Optional buckets, 1⅝ to 5 cu. yds.

Safety and Convenience: All bucket and boom mechanisms ahead of operator compartment for maximum protection. Steeply sloped cowl gives 100% visibility. Adjustable bucket seat and convenient controls. Safety ladder and hand rails for easy access.

Less Maintenance: Simplified boom and bucket mechanism has 4 to 10 fewer grease and pivot points to maintain. "O" rings and other seals keep grease in, dirt out.

"Keep Clean" Hydraulic System: Closed, pressure-controlled hydraulic system keeps out air-borne dust and moisture. New cylindrical oil reservoir has extra strength and an easily removed full diameter cover for thorough servicing.

"No-Stop" Full Power-Shift Transmission: Thoroughly proven. All shifts up or down, forward or reverse are made "on-the-go" with no stops for any "range shift" engaging of gears.

The H-70 series "C" has many other proven HOUGH features including a separate fan-cooled, oil-to-air radiator for effective cooling of both torque converter and transmission oil; torque-proportioning differentials for better traction; "operator's choice" dual brake pedals which permit braking with or without transmission engaged. For complete information on the tractor-shovel that "has everything", see your HOUGH distributor or use the coupon.

HOUGH®

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Send full data on the new Model H-70C "PAYLOADER"

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. . . Reader Comment

The Cost of New Shapes

SIR—I noticed with interest your editorial The Challenge of New Shapes (ENR Aug. 31, p. 80).

It has been our experience that there are no engineering problems in connection with these new shapes which cannot be met, but that generally speaking, the solution of these problems imposes added costs, usually hidden.

We know of one instance where a slight curve was introduced into an educational structure to eliminate long, straight corridors. This curve specifically added $250,000, or about 5% to the cost of the building.

In another case, a curved building which was constructed many years ago necessitated the bending of many pipes in connection with the plumbing and heating system. The curved piping layout was not too expensive in the original installation, but it is now proving to be a very expensive thing to maintain.

Perhaps the greatest additional cost involved in curved and other odd shaped buildings is the wasted use of interior space, often the greatest factor in causing excess costs in building construction.

FRED C. WOOD
Wood, Sibbert & Towet
Cos Cob, Conn.

Just About, but Not Quite

SIR—In your article "Trenton's New Sewage Treatment Plant" (ENR June 22, p. 50) you describe the 175-ft-dia trickling filters as "just about the largest models in use today."

Within the next month or two, 200-ft-dia trickling filters, each designed to handle maximum flows of 18,750 gpm, will be completed at the North Buffalo Creek Sewage Treatment Plant in Greensboro, N. C. Although these units are very large, I believe even larger units have been built in the past.

The North Buffalo Creek plant was designed by Hazen and Sawyer and is being constructed by Wm. Muirhead Construction Co., Durham, N. C.

C. RICHARD WALTER
Associate
Hazen and Sawyer
New York, N. Y.

For Your Calendar . . .

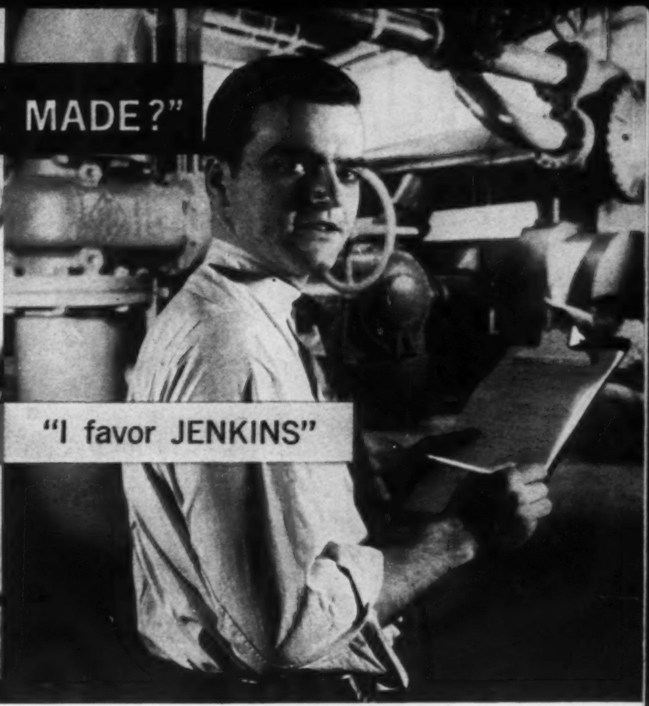
National Warm Air Heating and Air Conditioning Association, annual convention, La Salle Hotel, Chicago, Nov. 6-10. Write: James M. Martin, 640 Engineers Building, Cleveland 14, Ohio.

American Society of Mechanical Engineers, winter annual meeting, Statler Hilton Hotel, New York City, Nov. 26-Dec. 1. Write: ASME Meetings Department, 29 W. 39th St., New York 18, N. Y.

American Institute of Consulting Engineers, annual meeting, Engineers' Club, New York, Jan. 15, 1962. Write: AICE, 35 W. 45th St., New York, N. Y.

"WHAT'S THE BEST VALVE MADE?"

"JENKINS o'course"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Trusted by Everyone

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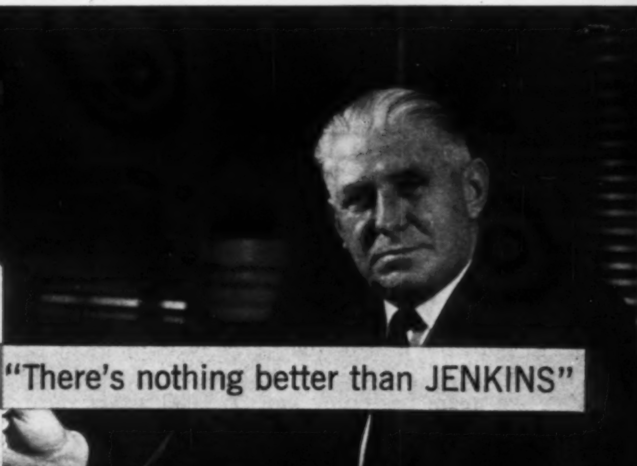
When you deal with the local Jenkins Distributor, you get the protection of a DOUBLE ASSURANCE of satisfaction: Valves of unexcelled quality and supply service of the highest caliber. Only the most competent distributors are selected by Jenkins Bros. to be the local sales and service facilities for Jenkins Valves. They have the stock, know-how and integrity to justify your full confidence. You'll find it good business to deal with your local Jenkins Distributor ... an important part of Jenkins Bros.

"We specify JENKINS"


"There's nothing better than JENKINS"

concrete wins with maintenance cost

5-year traffic test confirms again the findings of state highway departments and other official tests.

The test was ordered by the Oklahoma legislature to assure taxpayers maximum value for their highway tax dollars. Connecting two-mile sections of concrete and of asphalt, both the best of their type, were built in 1955 on Oklahoma's US 77, a 4-lane, heavily traveled route.

For five years beginning Jan. 1, 1956, exact records were kept of all *pavement* maintenance costs. Total for concrete: $557.82. For asphalt: $1,591.87. And not only did the asphalt cost nearly 3 times as much to maintain during the five years—it is already getting its first resurfacing at an additional cost of $43,753.

Substantial maintenance economy is one reason why concrete is the choice of so many states today—particularly for new Interstate routes.

Engineers are designing concrete pavements to last 50 years and more. It's the one pavement that can be designed *mathematically* to meet specific wheel load requirements. It's the only pavement with beam strength and stability. There is no internal aggregate movement or surface oxidation to shorten life.

The Oklahoma Test Road proves again the long-term value of concrete. The first cost isn't just a down payment. Concrete provides true economy for Interstate highways as well as for other heavy-duty roads.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

TEST ROAD
BEGIN PORTLAND CEMENT
CONCRETE SECTION
END ASPHALTIC
CONCRETE SECTION

The Oklahoma Test Road north of Oklahoma City will eventually be part of Interstate route 35

on Oklahoma Test Road 65% lower than asphalt!

COMPLETE RESURFACING AFTER ONLY FIVE YEARS ADDS ANOTHER $43,753 TO ASPHALT'S UPKEEP!

Despite continued surface maintenance for five years, the asphalt pavement on the Oklahoma Test Road has deteriorated to the point where complete resurfacing is required. The asphalt sections are being overlaid with 1½ inches of surfacing to seal out moisture and provide a new wearing course. When comparison is made, as shown here, on the basis of *total upkeep* cost, concrete's advantage is dramatic.

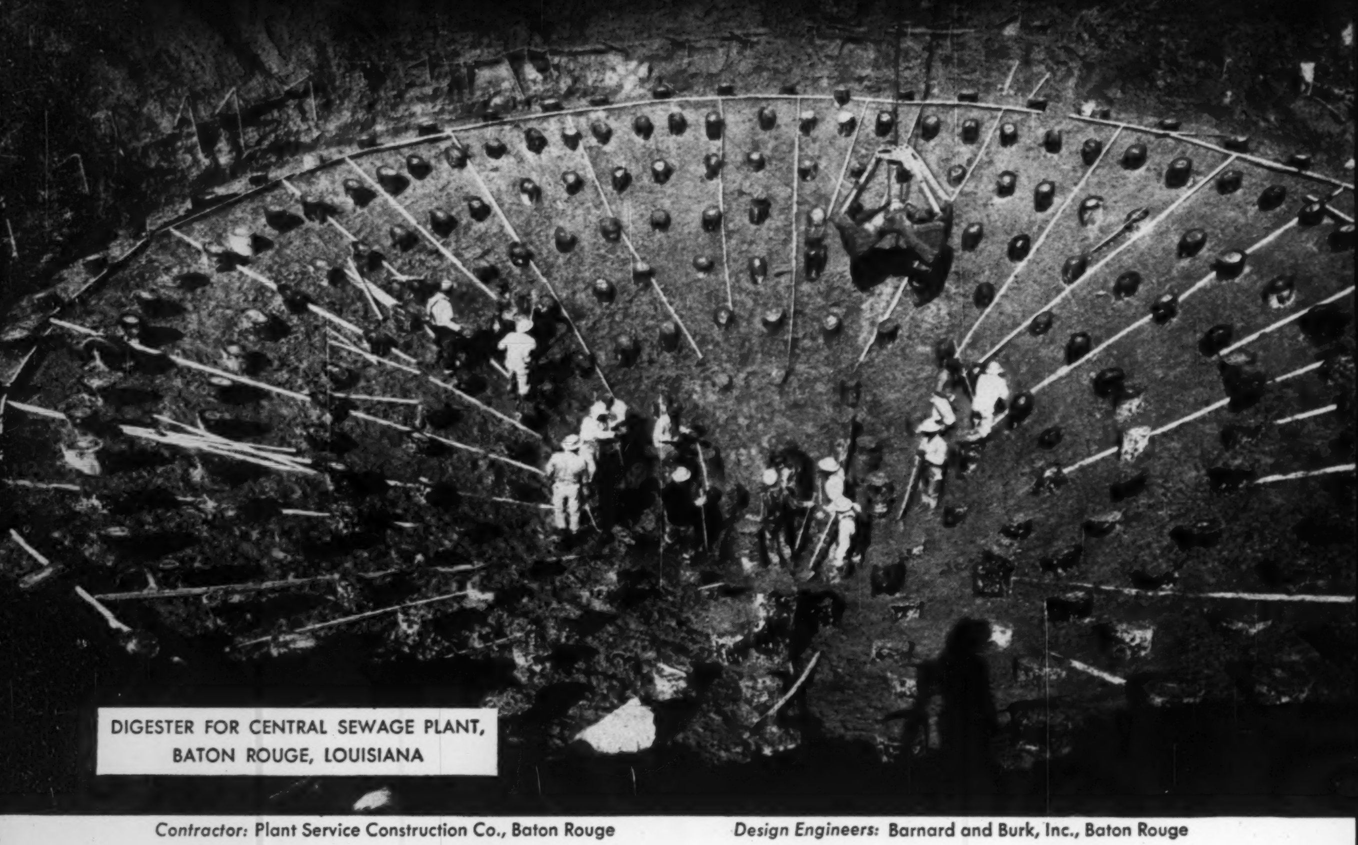
CONCRETE

5-year surface maintenance	$557.82
total surface upkeep	**$557.82**

ASPHALT

5-year surface maintenance	$1,591.87
complete resurfacing	$43,753.00
total surface upkeep	**$45,344.87**

CONTROL WATER...and YOU CONTROL COSTS



DIGESTER FOR CENTRAL SEWAGE PLANT, BATON ROUGE, LOUISIANA

Contractor: Plant Service Construction Co., Baton Rouge *Design Engineers:* Barnard and Burk, Inc., Baton Rouge

The contractor's problems on this project were varied and complicated. He had to:

1. Control from 16 to 20 feet of water in soft clay and sandy silt.
2. Maintain 60% slopes to pour the bottom cone of the digesters.
3. Protect the job from blow-ins by relieving the hydrostatic pressure of the nearby Mississippi River whose elevation changed constantly throughout the work.

He solved all problems successfully by installing a MORE-TRENCH WELLPOINT SYSTEM. Result—a trouble-free job.

If your problems involve WATER, call us. We can help you plan, bid, and execute wet work *at a profit.*

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index*

THE CONSTRUCTION WEEK

WHO'S RIGHT?—The question of rapid transit over the Golden Gate Bridge, on which both yes and no answers have already been rendered, will be posed to a panel of two or three engineers to be chosen from a list of 10 designated by the presidents of MIT and Cal Tech. The Golden Gate directors and officers of the Rapid Transit District will do the choosing.

DAM IN A JAM—A shifting foundation has brought work to a halt on the Corps of Engineers' Waco Dam, a 140-ft-high earthfill at Waco, Tex. Engineers say they may have to remove 2 million cu yd of material unless they can weight the toe enough to prevent further slippage. The dam is part of a $38.5-million project on the Bosque River.

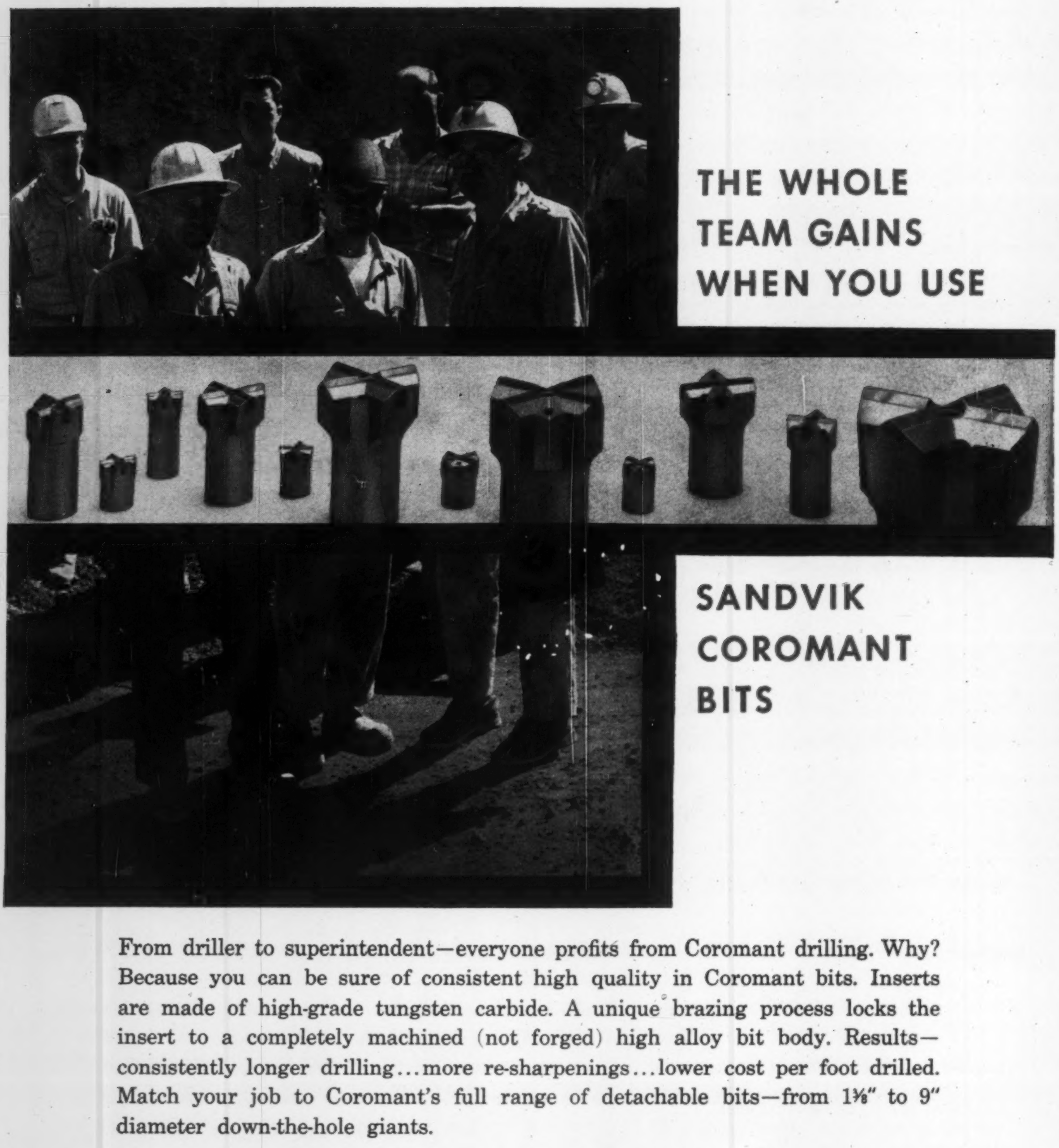
NUCLEAR DETECTION—The Federal Trade Commission, at the request of the Defense Department, plans a close watch on advertising of fallout shelters. FTC monitors will look for false or misleading advertising of such structures. It also plans publication of an advertising guide for sellers of shelters.

BETTER LATE THAN NEVER?—The Ohio River hamlet of Maysville, Ky., finally submitted a sewage plant construction schedule to the State Pollution Control Commission. The town, under fire for over 10 years for dumping raw sewage in the river, acted only after the state went to court last July threatening the city with $1,000-a-day fines. Since the construction timetable is 90 days late fines could total $90,000.

BPR HIRES A 'CITY BOY'—D. Grant Mickle, new Deputy Federal Highway Administrator, will concern himself primarily with urban phases of the federal-aid highway program, says his boss, Rex Whitton. Federal Highway Administrator Whitton, a self-styled "country boy," made this plain at last week's ASCE convention (see p. 25). Mr. Mickle is former director of the traffic engineering division of the Automotive Safety Foundation.

THE DRAIN ON MAINE—Federal grants-in-aid for sewage plant construction will go begging in Maine if the state legislature doesn't appropriate more funds for matching grants. A boom in sewerage construction exhausted the funds budgeted by the state.

TASTE AND SANITY TRIUMPH—The Chesapeake Bay Bridge-Tunnel Commission looked for months for a suitable name for the Chesapeake Bay Bridge-Tunnel, now under construction between Norfolk, Va., and the Delmarva Peninsula. After rejecting such names as Virginia Chespan, Robert E. Leeway, Virginia Capeway and Delmarva Peninsula Throughway, the Commission adopted ENR's choice (see July 6, p. 96)—The Chesapeake Bay Bridge-Tunnel.



THE WHOLE TEAM GAINS WHEN YOU USE

SANDVIK COROMANT BITS

From driller to superintendent—everyone profits from Coromant drilling. Why? Because you can be sure of consistent high quality in Coromant bits. Inserts are made of high-grade tungsten carbide. A unique brazing process locks the insert to a completely machined (not forged) high alloy bit body. Results—consistently longer drilling... more re-sharpenings... lower cost per foot drilled. Match your job to Coromant's full range of detachable bits—from 1⅜" to 9" diameter down-the-hole giants.

TEST THEM ON YOUR JOB—THAT'S THE BEST PROOF! Contact the Atlas Copco district office near you, or write—

A perfectly-balanced drilling team—Coromant "Rope Thread" steel and bits with Atlas Copco rock drills... and Copco compressors.

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LYtell 1-0375

WASHINGTON OBSERVER

- **Missile base labor peace pattern planned**
- **JFK to order housing discrimination ban**
- **Pro-Red neutrality slows Volta Dam loan**

- **Negotiations are under way for a project agreement covering all labor contracts at Cape Canaveral.** They are a direct outgrowth of attempts by President Kennedy's Missile Sites Labor Commission to prevent labor trouble at missile bases (ENR Oct. 19, p. 23). The Commission has told contractors and AFL-CIO craft unions to negotiate a master contract that will be submitted to the Air Force for approval when it is completed. If accepted, it would set a pattern for other missile bases across the nation.

Union leaders have indicated that they may be willing to trim travel-time and overtime costs. This, of course, would make a master contract more acceptable to the Air Force. Defense officials like the idea of such a contract and are willing to give it a try while waiting to see if it actually saves contract costs over the current system. Sole objection so far comes from industrial union officials who contend that the single-agreement plan would freeze their members out of missile base work. Official position of the President's Commission: Negotiate a contract and we'll see if this is true.

—

- **An order banning discrimination in FHA and VA mortgages is under "very serious" consideration at the White House.** The President is committed by a campaign promise to take such action on government-insured mortgages. He could hedge by issuing a broad policy declaration against discrimination and by setting up a committee to try to get voluntary compliance from major builders and developers. But the current word from the White House is that he will go all the way with a flat discrimination ban. The biggest deterrent: A fear that such action would affect the rate of private homebuilding, already a sluggish factor in the economic recovery.

A non-discrimination order in FHA and VA mortgages would go only part of the way recommended by the Civil Rights Commission. This group recommended a similar anti-discrimination clause in all mortgages by banks which come under federal supervision (ENR Oct. 12, p. 22). This would cover about 90% of the housing market. But the President won't go this far—considers it too much federal intervention in private business matters.

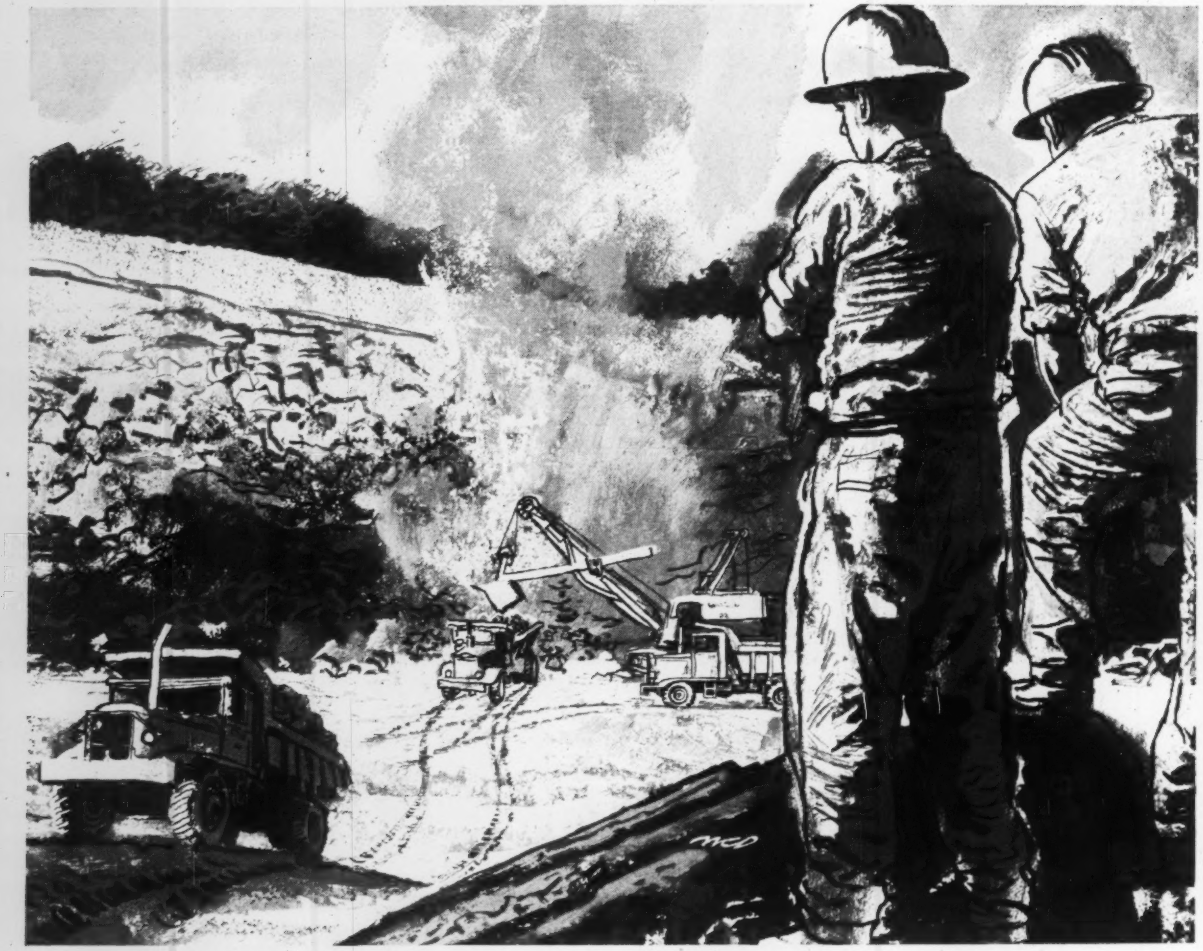
—

- **A U. S. loan to Ghana for the Volta River project will be forthcoming—but only after Ghana mends its political ways.** That is the consensus of those in Washington who have been working on the long-delayed loan. Ghana wants to build a $168-million hydroelectric system that later would feed an aluminum plant to be built by a private group, headed by Kaiser. The bulk of the money is contingent on a U. S. loan of $30 million, which was scheduled for approval October 5.

President Kenndy has shown displeasure at Ghana's not-too-neutral position at the Belgrade meeting of neutral nations. Ghana President Nkrumah seemed to be taking the Soviet position on such issues as Berlin. The U. S. promptly announced it would take another hard look at Ghana's political and economic situation to see if the loan is warranted. A decision should be forthcoming before year's end.

PROTECTION IN DEPTH

How it helps cut compensation costs



Had any accidents down on the floor lately?

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OCTOBER 26, 1961

ENGINEERING
NEWS-RECORD

"Most of us realize that all of us involved in urban problems are trying to serve people and solve the same basic problems. We are just beginning, however, to learn to work and move forward together instead of getting in one another's way" —Robert C. Weaver, Administrator, Housing and Home Finance Agency.

"There will be no wild breakthrough in the utility field by 1980, especially in those aspects which are part of the civil engineer's field. . . . We must educate the public to the point where they are willing to pay for improvements . . ." — Samuel Baxter, Water Commissioner and Chief Engineer, Philadelphia.

"The general pattern of our transportation development in the years ahead must be fashioned out of what we have today . . . even in America we cannot afford the luxury of bulldozing it all down and starting all over again." —Austin J. Tobin, Executive Director, Port of New York Authority.

"Planners, engineers and administrators will have to . . . recognize that the city as it exists today is a success . . . perhaps not the utopia it might have been, but nonetheless providing in a reasonable degree for the needs and satisfactions and economic well-being of its citizens." —Rex M. Whitton, Federal Highway Administrator, Bureau of Public Roads.

ASCE Looks at the City of 1980

Tomorrow's city will be today's city—but bigger and, hopefully, better.

In New York City last week the annual convention of the American Society of Civil Engineers addressed itself to the theme, Metropolis 1980. And the major speakers on that theme (above) seemed all to be saying, without prearrangement, that improved urban living must be achieved by building on what we now have.

Not one of these speakers hinted that an H-bomb holocaust would settle matters for our cities before 1980. Even as Nikita Khrushchev was telling the delegates to the Communist Party Congress in Moscow what wonders of good living would be ready for them in 1980, these administrators and engineers were forecasting better days for U. S. cities.

Transportation got considerable attention as a serious urban problem. But the point was made by one speaker after another that coordination of plans was the most pressing problem.

Housing Administrator Weaver put it this way: "What any of us does or doesn't do—whether as planners, as builders of public works and highways, or as providers of housing—can create problems for all of us."

Highway Administrator Whitton claimed progress in the coordination of urban highways with other urban plans for the future. "I have yet to receive facts that would prove that highway construction in any instance has been detrimental to the future growth and development of the cities involved," he said. Mr. Whitton plumped for teamwork among planners. But departing from his prepared text, he made clear that the Bureau of Public Roads and the state highway departments, with the purse strings, will retain firm control over urban highway location.

The Port of New York Authority's Austin Tobin, pleading for "balanced" transportation in metropolitan areas, made some caustic comment on utopian planners. He decried the "home-styled experts" who wail at the wall of Megalopolis, cry havoc, but offer little.

Mr. Tobin stressed the need for balanced use of commuter lines, buses, rapid transit and automobiles. Further, he predicted that the publicly operated helicopter will play an increasing role.

The convention's focus on the future went beyond the Metropolis 1980 theme of the luncheon speeches.

- The Board of Direction took a far leap into the wild blue yonder in approving a change in name for the Air Transport Division—to the Aero-Space Transport Division.
- The Board approved a policy statement defining the role of the civil engineer in future planning.
- The Board also adopted a new format for future national conventions (see editorial, p. 100).
- And in the technical division sessions of this convention (see pp. 22 to 25), several papers took a look ahead.

Water:

Research $ Running Dry

Metropolis 1980 may have the same kind of water treatment plant it has today if engineers don't show more "imagination and daring" than they have in the last 25 years, says Vance C. Lischer, partner in Horner and Shifrin, St. Louis consultants.

Mr. Lischer delivered a paper on simplified water filtration plant design before the Sanitary Engineering Division, but he made it plain that the departures from conventional designs that he was discussing were exceptional.

"The very nature of the public trust imposed on public officials in the expenditure of public funds creates an atmosphere of ultra-conservatism under which dynamic and creative engineering is difficult."

A second reason for the lack of progress in waterworks engineering stems from the dearth of research, Mr. Lischer said.

In citing the federal government's research effort at the Taft Engineering Center, Cincinnati, Mr. Lischer remarked, "There is no reason why the waterworks industry could not have assumed this obligation directly."

The challenge to engineers in foreign construction projects is apt to demand much more than mere planning and design of a project, according to Ralph L. Bloor, an engineer with the International Bank for Reconstruction and Development (World Bank) who addressed the Waterways and Harbors Division.

He suggested that "the professional duty of the engineer to serve the best interests of his client (generally an underdeveloped nation) may require efforts beyond anything normal in the U.S."

Since, often the World Bank is not approached for a loan until after nations have selected and planned a project on their own with only the help of outside engineering consultants, Mr. Bloor pointed out that the Bank sometimes finds it hard to adjust the project to what it thinks the country needs and can pay for.

When neither the World Bank nor any other economic or financial institution has given the project any attention, the engineer should consider those matters, he said.

"The Bank's experience with engi-

Power Division Talks Pumped Storage

Speakers at a Power Division symposium generally agreed that pumped storage power will continue to gain in importance and extent of use, mainly because:

- It has particular value as peaking power.
- It can make many otherwise uneconomic hydro sites worthwhile.
- Recent and continuing equipment advances are changing the whole picture.

Past, present and projected pumped storage developments come up for review, and the speakers noted that both individual units and plants are increasing in size rapidly. The New York State Power Authority's pump-generating station at Niagara Falls, for example, will probably be the biggest pumped-storage power installation operating anywhere for a short time after it is completed. But meanwhile, construction has begun on three other plants with greater capacities: Union Electric Co.'s Taum Sauk plant, in Missouri, 350,000 kw; the North of Scotland Hydro-Electric Board's Cruachan plant, in the Loch Awe development, 400,000 kw; and Luxembourg's Vianden plant, 400,000 kw initially, 900,000 kw ultimately.

M. G. Salzman, of Ebasco Services, Inc., New York City, said pumped storage will permit development of many natural reservoir sites that would have to be passed up as uneconomic for conventional hydro. They might be made economically attractive, he said, by the recirculating type of pumped storage, also called pure pumped storage, in which the same water (with makeup for small losses) is transferred repeatedly between a high and a low reservoir. The low reservoir might be created by construction of a small dam on a minor stream or a low diversion dam on a main stream, he said, and the high reservoir might be built on an adjacent mountain or high ridge.

R. D. Ley and E. S. Loane, respectively hydraulic engineer and assistant to the vice president, General Public Utilities Corp., Reading, Pa., cautioned against assuming pumped storage to be the best and cheapest peaking installation that could be installed. It is only one of several peaking power sources currently attracting attention in the utility industry, they said.

This interest in peaking power has a substantial economic base, they stated, but "some of the apparent interest in pumped storage seems to have no sound basis whatsoever."

Mr. Ley and Mr. Loane reminded the engineers that pumped-storage power generation is a net consumer of energy, taking three kilowatt-hours out of the system for every two it returns. The authors said they have found the energy penalty approximately equal to the benefits of reduced operation and maintenance costs and increased reliability and availability.

"This leaves the cost of the initial construction as the deciding factor for or against the installation of pumped storage," they said. "If pumped storage costs more than the alternative steam plant, except where the pumped storage has special use, it is a poor pumped storage and no magic of finance can make it a good one."

neering cost estimates is much like that of everyone else—they are often not accurate and they are usually too low," Mr. Bloor said.

Pointing out the difficulty of estimating costs on a project in a foreign land, Mr. Bloor said, "I see no reason why contingency allowances for foreign construction should not normally be higher than for construction in the U.S., and under especially difficult circumstances they should be several times as high.

"Please don't be embarrassed, so far as the Bank is concerned, if your contingencies are a substantial part of your total cost estimate," he said.

But in underdeveloped countries this influence is lacking and furthermore, local governments often feel that they have hired a foreign engineer who knows practically everything and that whatever he says is unquestionable, he said.

Garbage grinders will not increase the pollution of the nation's streams if properly designed sewage treatment facilities are provided, according to a paper presented by K. S. Watson, General Electric Co. consultant on water management and water control.

The Denver suburb of Aurora (pop. 50,000), which has no industrial waste load, has an ordinance requiring garbage grinders in all new homes and commercial buildings with kitchens. Roughly 60% of the homes in Aurora have disposers and are connected to the city's treatment plant, Mr. Watson said.

Complete treatment is provided for the sewage and the plant is about 90% efficient in BOD and suspended solids removal, yet "there have been no increases in the costs of operating and maintaining the system," according to Mr. Watson.

Increasing seashore land values have spurred more and more communities to stabilize inlets by installing permanent sand bypassing equipment, according to a paper presented by George M. Watts, assistant chief of the engineering division of the Corps of Engineers Beach Erosion Board.

Until 1950 only two permanant sand-bypassing projects were in operation to keep coastwise drifting sand from plugging ship channel inlets and to nourish beaches downcurrent from the inlets. Since 1950 five more have been installed and many more are being considered, Mr. Watts reports.

Expanded research is needed in nearly all areas of sanitary engineering but the money to finance it isn't available. This was the keynote of a report to the Sanitary Engineering Division by its research committee.

On stream pollution, Milo Churchill, chief of TVA's stream pollution control section, posed the following questions as areas where research is most needed:

- How can low oxygen concentrations be avoided in water discharged during summer months through hydroelectric power intakes located low on the face of dams with deep reservoirs?
- Quantitatively, how are basic clean-water stream reaeration rates affected by various pollutants in the stream?
- How can a realistic benefit-cost ratio be developed for application on a case-by-case basis for water pollution control?

James D. Calvert, Jr., and C. A. Hunt, both vice presidents of Fargo Engineering Co., Jackson, Mich., believe that despite the trend to big plants, there will still be an important place for small pumped-storage plants to improve system operation or conserve head and water.

These authors' review of pumped-storage practice in the U.S. made it plain that reversible pump-turbines are getting the nod in newer installations. Of the four pumped-storage plants now in operation in the U.S., two (Buchanan and Rocky River) have separate pumps. But the two newer ones (Flatiron, 1953, and Hiwassee, 1956) have reversible units and so do the others presently under construction (Niagara, Taum Sauk and Smith Mountain).

However, Mr. Calvert and Mr. Hunt believe it may be desirable to consider separate pumps for very high heads because as head increases, the reversible units have to be submerged to increasingly greater depths below tailwater level to prevent cavitation.

Three Europeans suggested another answer for the added excavation costs entailed by deep submergence. If the powerhouse is built underground, it can simply be located farther below the surface without altering its size, said M. Braikevitch and D. Hartland, of English Electric Co., and R. A. Strub, of Sulzer Bros., Switzerland.

Civil construction will play a smaller role in pumped-storage projects than in conventional hydro jobs, said these authors. The reason is that reservoirs are usually smaller and pumped-storage economics require reservoirs to be close together to reduce conduit cost.

Mr. Salzman pointed out another reason why pumped-storage projects should be compact: Transmission losses, both hydraulic and electric, are incurred in two directions.

The three men stated the economic justification for pumped-storage in more emphatic terms than most authors: "Pumped-storage development stands or falls by the over-all economics of the conversion of surplus night energy to meet daytime peaks."

M. J. Hronich, of American Electric Power Service Corp., New York, and J. M. Mullarkey, of Ebasco Services, Inc., reported that Appalachian Power Co.'s two-dam Smith Mountain pumped-storage project on the Roanoke River will develop a dependable peaking source "greater by a factor of 10" than would have been provided by conventional step development of the same stretch of river.

Frank E. Jaski, of Allis-Chalmers Manufacturing Co., predicts such a great expansion of pumped-storage power that it "can even surpass the total capacity of conventional hydropower in use today."

Richard D. Harza, of Harza Engineering Co., reporting on pumped-storage power development outside the U.S., sees nuclear power development as a stimulant to future pumped-storage development. This has already occurred in Great Britain, he said. Mr. Harza believes European pumped storage, now almost entirely the separate pump type, will turn to reversible pump-turbines.

City Planning:

Accent on Conservation

Conservation of existing housing rather than demolition and rebuilding in slum areas gets major emphasis in New York City's urban renewal program, reported James Felt, chairman of the City Planning Commission.

Liberalized provisions of recent state and federal housing laws reflect the growing disenchantment of city planners with the old-fashioned urban renewal approach, which focused its efforts on first rebuilding the most blighted slum districts.

"A stitch in time saves nine"—the lesson of the old cliché has impressed itself on most city planners.

Aided by the wide range of activities approved and the funds appropriated under the Federal Housing Act of 1961, New York is marshalling a total attack on its urban problems. A Community Renewal Program, financed with federal and local funds, embraces the whole city divided into 87 communities with average population of 100,000. During the next three years the staff will draw up a renewal program for the entire city. It will relate the needs of local districts to the needs of the whole city, assigning projects in order of priority and coordinating them with plans of other city agencies so that capital improvements can be scheduled within the framework of a comprehensive plan.

Mr. Felt cautioned against excessive reliance on publicly financed programs. "We must not relax the pressure for unassisted private redevelopment though many blighted areas require state, federal and local assistance," said Mr. Felt.

How New York City is tackling the staggering problem of providing the 300,000 to 400,000 additional decent dwelling units needed was the subject of J. Clarence Davies, Jr., chairman of the Housing and Redevelopment Board.

Tax abatement and mortgage loans with interest rates subsidized by ½ of 1% supplement the federal write-down grants in New York City's housing program. These aids have been effective in stimulating nonprofit housing development in the city.

Second only to the primary goal of building new housing is the elimination of slums—industrial and commercial, as well as residential. And a third goal of the city's program is halting advancing blight, said Mr. Davies.

Illustrating an economical method of reversing the skid of a "gray area" neighborhood into the oblivion of slumhood,

ASCE Studies New Data on Joints

The ASCE considered structural connections in steel, concrete and timber during several convention sessions.

T. H. Hazlett, professor of industrial engineering, University of California, Berkeley, described successful experiments with friction welding. This is a fusion process in which the necessary heat is generated by clamping one of the two pieces to be welded in a stationary chuck and rotating the other at high speed under an axial load.

Professor Hazlett reported he was able to develop 100% joint efficiency. He found that there were optimum values for the applied pressure; strength decreased when these values were exceeded. He also discovered that the relative motion between the two members must be stopped quickly at the time the weld is made.

Tests reported by Profs. William H. Munse and E. Chesson, Jr., of the University of Illinois, Urbana, shed new light on the tensile behavior of riveted and bolted truss-type connections. The researchers conclude that gusset plates are not always effective over their entire width. Designers, they said, should consider joint pattern, method of hole manufacture (punched or drilled), distribution of area in the connection and length of connection.

Professor Chesson recommended that an upper limit be placed on the maximum proportion of the gross area that may be considered effective in resisting a tensile load. He believes this limit could be set at 85% if separate design stresses are specified for punched and for drilled members.

Edward R. Estes, chief engineer, Florida Steel Corp., Tampa, predicted that shop bolting will replace shop welding as well as shop riveting. He based this prophecy on economies stemming from a 1960 specification change. This assigned high allowable stresses to high-strength bolts, approved use of heavy hexagon bolts, called for shorter-length threads, and eliminated some washers.

The flexibility of modern welding techniques has made steel pipe sections practical for greater use as columns, according to Anthony A. Tropac, associate professor of civil engineering at the University of Texas. The U. S. lags far behind Europe in taking advantage of the superior geometric properties of steel pipe columns, he said.

The advantages of bolted scarf connections in precast concrete members, common in Great Britain though little used in the U. S., was the topic of Eivind Hognestad, manager of the Structural Development Section of the Portland Cement Association. Mr. Hognestad cited test results emphasizing the disastrous joint weakening from relatively minor design oversights. He cautioned engineers designing these connections to place these joints only near points of inflection, to design them for joint moment and shears, and to check bond lengths, which can be very critical in this type of connection.

Epoxy resins may replace shear connectors in composite construction, report James D. Kreigh and Gene M. Nordby, professors at the University of Arizona conducting a research program for the Bureau of Public Roads and the Arizona State Highway Department. They have developed an epoxy resin that develops over 5,000-psi tensile strength and 2,000-psi shear strength bonding steel-to-steel.

Mr. Davies described a West Side Manhattan conservation project of 10 city blocks. The city concentrated its housing services to aid community organization, provided tax abatement where improvements were made, and opened an office to assist the area residents. At a cost of only $20,000 to the city, this two-year program brought the 10-block district up to the sound level of its neighbors.

Mr. Davies appealed for ASCE's support in maintaining the level of federal urban renewal assistance, which he maintains is essential to preserve the health of our cities. He also said that as a long-range goal, "We have got to take the profit out of slums."

At a session generating a little heat as well as light to enliven the proceedings, Alex Hart, executive director of the New York-New Jersey Transportation Agency, said that a two-block walk from the subway puts many New Yorkers in their cars.

He cited results of a "journey-to-work" survey showing the extreme sensitivity of travel patterns to short distances from subway stations. A firm located several blocks from a subway station may have eight times as many employees commuting by automobile as a nearby firm located very close to the station.

The Manhattan-based employees surveyed, however, leaned heavily on public transit for their journey to work—94% reported public transit as their major means of commuting to work.

A speech by Laurence A. Dondanville, staff engineer of DeLeuw, Cather & Co. of Chicago, roused one of the few controversies of the convention.

Mr. Dondanville praised private and public parking garage programs as a means of bolstering retail business in the downtown areas. He described the creation of parking authorities during the past decade as a means of providing space particularly for the "short-term" parker.

The ensuing controversy centered on the justification for subsidizing parking facilities, the over-all economics of parking garage construction, and the effect of stimulating additional traffic congestion in densely developed downtowns.

Transportation:

Improve Urban Highways

William A. Bugge, director of highways for the State of Washington and chairman of the executive committee of ASCE's Highway Division, took a long, hard look at urban highways of the future.

"Completion of the Interstate system—and other urban freeways—will have a profound effect upon our urban society," said Mr. Bugge. "The most important determinant in the pattern of urban growth is the method and means of transportation provided."

Mr. Bugge advocates the development of separate routes for commuter, through, freight and land-service traffic. Said he, "Establishment of an all-purpose facility or system can not be done in the future. Separate systems must be established, for . . . design of an all-purpose roadway cannot result in maximum efficiency."

The Washington engineer envisions almost completely automatic surveying, mapping and location processes for highways of the future, using space satellites, airborne instruments, microwave communications and computers.

He says speeds up to 150 mph will be possible on highways of the future by electronic guidance systems that will control not only speed, stopping and lane changes, but also times of arrival and departure.

Wilbur S. Smith, New Haven, Conn., traffic and planning consultant, predicts that 16,000 miles of urban freeways will be needed by 1980. There are now about 3,000 miles of such roads in service. Completion of the Interstate system will extend the total to about 9,600 miles, still far short of the goal.

Says Mr. Smith, "Future mass transit in most cities (excluding the largest) will be provided by express buses operating on freeways either within specially designed peak-hour traffic lanes, or along special median lanes."

Saying that tools are now available to do the job, Mr. Smith called for a coordinated approach, involving all modes of transportation and governmental agencies to provide a sound, effective urban transportation program.

Highways and other forms of land transport were also important and much discussed topics of the sessions dealing with air transportation. The spread of urban areas and the increased runway needs of today's airplanes have forced the building of airports at great distances from population centers and it was the consensus of those concerned with air travel that far more consideration must be given to getting passengers between cities and airports.

A great future for pipelines was predicted by Charles C. Wittelsey, president of Ford, Bacon & Davis, Inc., who says that one day pipelines will replace railroads and trucks as movers of such solid materials as coal, ores, chemicals and grains. He called on imaginative engineers to get into pipelines everything that can be made to flow, "because the pipeline is second to none in its ability to move vast quantities of material. And when the demand and load factor is high enough, it is without peer in economy."

"Coal, mixed with water," he noted, "is already being piped more than a hundred miles in Ohio to a Lake Erie power station."

Pipelines, he said, will also act as giant mixing vats in which raw materials are processed in transit. Experiments in processing wood pulp in transit are already being conducted.

At ASCE—Top Jobs . . . Top Honors

A new president, and two new vice presidents took office, and four engineers received the coveted designations of Honorary Member at the 1961 ASCE annual meeting.

New Officers:

President: G. Brooks Earnest, president, Fenn College, Cleveland, Ohio (see Men and Jobs, p. 54).

Vice Presidents: Carey H. Brown, retired manager of engineering and services, Eastman Kodak Park Works, Rochester, N.Y.; **Burton G. Dwyre**, consulting engineer, Santa Fe, N.M.

Honorary Members:

Samuel B. Morris, former general manager Los Angeles Department of Water and Power and consulting engineer, Los Angeles, Calif.

George S. Richardson, consulting structural engineer, Pittsburgh, Pa.

Thorndike Saville, former dean of engineering, New York University and consultant on water resources and coastal engineering, Gainesville, Fla.

Abel Wolman, professor of sanitary engineering, Johns Hopkins University and world-wide public health consultant, Baltimore, Md.

Russian builders failed to meet their quotas, so . . .

Comrade Khrushchev Cancels New Capital

Premier Nikita Khrushchev has personally conceded before a top Communist audience that the Soviet Union's massive construction program is in real trouble.

Although predicting great things for Russia by 1980, he told the 20th Congress of the Communist Party meeting in Moscow last week that it will be necessary to stop all new capital construction starts, except for top priority jobs, for one year. Russia will have to devote all funds to completion of building projects already under way.

The Communist Party Central Committee and the Soviet government have "recently adopted a decision laying down sequence for capital construction," Mr. Khrushchev said. Under the new program only particularly important projects will be approved.

Russia's construction industry has not been meeting its quotas under the current Seven Year Plan (ENR June 22, p. 43). This is despite an over-expenditure of rubles. Alarm has been growing more and more noisy with the appearance of critical articles in the Soviet press.

Mr. Khrushchev touched on some key problem areas in construction when he belabored the tendency to rush new starts, which is against interests of the state.

"The question of questions, Comrades, is capital construction," Mr. Khrushchev said in his six-hour opening speech to the Party Congress. Noting average annual growth of investments for construction in the first three years of the Seven Year Plan actually averaged 11% per year compared with a plan quota of 8.6%, he lashed "opponents who said the investment program couldn't be realized."

"This overfulfillment of plan for investments means that in the course of three years out of seven we are investing an additional sum of more than 3.5 billion rubles in the economy," Premier Khrushchev said. (At the official rate, one ruble equals $1.11.)

He quickly added, however, there are "very many shortcomings in building. At the present time there are over 100,000 construction sites in the country, half of them for industry. With this huge number of projects in hand simultaneously, funds and materials are scattered and many enterprises go into production two or three years later than technical possibilities permit. Funds expended are frozen over a long period . . . Why is that?"

Answering his own query he began using blunt language:

"It frequently happens that plausible excuses of solicitude for state interests are used to cover out and out parochialism; to put it crudely. It is grabbing on regional, territorial and at times even republican scale. Republican councils of ministers, economic councils, ministries and local party bodies try to get funds to start the greatest number of projects without considering whether necessary building materials, manpower and equipment can be supplied, and

After talk of connection details, research and sales . . .

Concrete Prestressers Stress Fire Resistance

Designers and producers of prestressed concrete building and bridge components gathered in Denver last week to discuss matters ranging from connection details to sales. It was the seventh annual meeting of the Prestressed Concrete Institute.

General sessions dealt with fire resistance, important structures, connection details, and research. Producers' sessions covered production techniques, estimating and sales, and relationships with architects and engineers.

Recent fire tests, plus the analysis of previous tests, have broadened available knowledge about fire resistance of prestressed concrete, said Jack Bono of Underwriters' Laboratories, Inc.

"At the present time," said Mr. Bono, "Underwriters' Laboratories is labeling a number of designs of prestressed concrete slabs, having fire resistance ratings of up to four hours."

A. H. Gustaferro of the Portland Cement Association analyzed the results of some 50 tests on prestressed concrete structural members. Mr. Gustaferro listed seven factors that influence fire resistance: "Most important of these," he said, "are the thickness of concrete between the prestressing steel and the surface exposed to fire (cover), degree of end restraint and dimensions of the cross section."

With respect to cover and cross section, Mr. Gustaferro reported the recommendations of a task committee of the Illinois Section, American Society of Civil Engineers. For recommendations of that committee for cover for various fire resistances, see table below:

	Cross-sectional	Rating			
Type of Unit	*Area (sq in.)**	*1 hr*	*2 hr*	*3 hr*	*4 hr*
Girders, Beams, Joists..........	30-150	2 in.			
	150-300	1½ in.	2½ in.**		
	Over 300	1½ in.	2 in.	3¼ in.**	4 in.
Slabs, Solid or Cored..........		1 in.	1½ in.	2 in.	

** In computing the cross-sectional area for joists the area of the flange shall be added to the area of the stem and the total width of the flange, as used, shall not exceed three times the average width of the stem.*

*** Adequate provisions against spalling shall be provided by means of wire mesh.*

With regard to end restraint, Mr. Bono said, "A small amount of restraint or continuity was found to improve greatly the fire resistance. The test end-point is generally determined by heat transmission when assemblies are partially restrained."

Simply supported test specimens, said Mr. Bono, "reach an end-point when the temperature of the prestressed reinforcement reaches a level somewhere between 800 and 1,000 F. If a specimen is fire tested when fully restrained . . . severe spalling can be expected."

E. A. Picardi, chief structural engineer for architects Skidmore, Owings & Merrill, described the design of the $8.3-million Evergreen Plaza Shopping Center, Evergreen Park, Ill. About 900 precast T-beams and 1,700 precast, prestressed core slabs will form a structure with 500,000 sq ft of supported floor and another 500,000 sq ft of elevated parking deck.

Structural elements forming each basic bay unit consist of cast-in-place footings and piers that support precast concrete bents at 22-ft centers with precast, prestressed slabs spanning 49 ft 6 in. between bents.

Construction

planning bodies do not prevent these acts that contravene interests of state. This leads to stoppages, low labor productivity, protractions of schedules, extra expenses and higher building costs."

On the subject of housing, Mr. Khrushchev had somewhat better news. He said the state housing program thus far has been fulfilled. More houses were built in the last five years than in the preceding fifteen. Nearly 50 million people, almost one-fourth the population, moved into new houses in Russia in that period.

But he said measures are being taken to accelerate homebuilding because population increase is exceeding estimates.

During the remaining four years of the Seven Year Plan about 400 million square meters of housing will be built. Still, Premier Khrushchev said, haste to construct new houses causes many defects. "Those responsible for defects should be rapped over the knuckles," he said.

at Meeting

Carroll S. Delaney and Neil R. Runyan, of Carroll S. Delaney and Associates, Inc., Denver structural engineers, described the Denver-U. S. National Bank parking structure now being built in downtown Denver. The 133-ft wide by 225-ft long parking floors are post-tensioned (a single line of interior columns results in floor spans of 66 ft 6 in.). The floor spans are framed with 24-in.-deep concrete waffle slabs supported by beams 30 in. deep.

Harold B. Cooke, Jr. of the Jones-Dabney Co., Louisville, Ky., described the construction of two prestressed concrete railroad bridges with epoxy shear keys. One is a 29-ft span on the Burlington line in Rochelle, Ill., where four prestressed girders were bonded together with an epoxy grout.

The other is a structure on the Rock Island line near Letts, Iowa. This new bridge comprises two 33-ft prestressed concrete spans with a ballasted deck. The spans were preassembled and bonded with epoxy grout. The producer cast the girders with shear key slots in adjacent sides.

R. J. Lyman, chief engineer of Atlas Structural Concrete, Inc., El Paso, Tex., is PCI's new president.

Around the World . . .

• **Bigger boom for the Corps**—Thoroughly impressed by the boom dredge Zulia (ENR Mar. 23, p. 122), the Corps of Engineers plans to incorporate the boom feature into one of its new hopper dredges. The Zulia, working last year in Lake Maracaibo, moved nearly as much earth as the Corps' entire fleet of 15 hopper dredges, and at nearly half the cost.

• **Obstructed obstructions**—A Superior Court Judge has upheld city objections to lawsuits filed by two taxpayers seeking to void all land acquisition transactions for San Diego's $46-million Center City project (ENR Oct. 5, p. 25).

• **Inspection gallery**—Engineers at Beaver Dam in Arkansas found a natural cavern that runs for nearly 300 ft under the site and could cause a leaky reservoir. Builders on the $51-million Corps of Engineers project will fill the cave with concrete and grout the area nearest the dam.

• **Permanent pipelines only**—The Federal Power Commission will no longer grant temporary construction permits for interstate gas pipelines. FPC argues there is little chance to undo construction begun under a temporary permit when public hearings are held later for a permanent permit. Exceptions will be made for emergencies or minor expansions.

• **Javanese dams**—Indonesia plans to build six power dams on the Brantas River in eastern Java. The first and largest (300 ft high) begins next year. It is planned to impound about 4,900 acre-ft and produce 75,000 kw.

• **Bonneville engineer resigns**—Eugene C. Starr, chief engineer of the Bonneville Power Administration, has resigned, effective October 30. He said he is quitting the job he has held since 1954 for "reasons of a personal nature." E. L. White, deputy chief engineer, assumes Starr's duties until a replacement is named.

Old Dangers Demand New Safety

Contractors have a dangerous tendency to reason that temporary structures need fewer safety measures than permanent structures, said a speaker at the annual meeting of the National Safety Council's Construction Division in Chicago last week.

"Not enough precautions are taken by either the contractor or the engineer to insure the safety of so-called temporary construction," says Harry T. Immerman, of Spencer, White and Prentis. He included in this category the shoring of forms for casting floors and walls, sheeting and bracing of excavated areas, and scaffolding for building construction.

Apparently the average engineer or constructor tends to be less conservative when designing or constructing something that is not to be a permanent installation, he said.

One of the best ways to drive home the need for safer construction, believes J. W. Symonds, of Peter Kiewit Sons' Co., is by photographing unsafe practices.

"The need for intensive training of the younger men in construction safety," says Mr. Symonds, "is borne out by the fact that most accidents happen to our workmen in their late teens or early twenties."

"From the electrical contractor's standpoint, the grounding of portable tools is our worst hazard," said J. R. Powell, of the Powell Electric Co., Dallas.

"The lack of safe extension cords and the improper use of rubber gloves are almost equally as hazardous," he said. Mr. Powell also told his listeners that better cooperation between the electrical contractor and other contractors on the job, would do much to reduce accidents of an electrical nature.

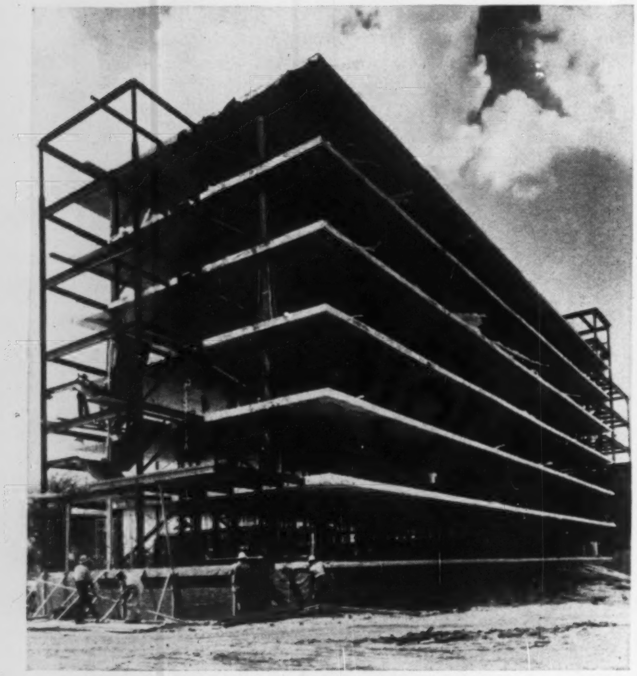
"Safety codes requiring conventional shoring of open trenches exclusively should be revised to permit use of sliding trench shields where conditions are suitable," says John V. Otter, of Morrison-Knudsen Co., who presented facts and photos of trench-shielding on a number of M-K jobs.

Sliding trench shields provide better protection for workmen, he says. They offer greater economies in the cost of sewer construction and they permit pipe-laying and backfilling close behind trench excavation, to accommodate street traffic quicker than conventional shoring.

Robert A. Wendell, chief of the Safety Branch of the U. S. Army Corps of Engineers' South Atlantic Division, Atlanta, Ga., was elected general chairman. Frederick H. Deeg, of the National Association of Mutual Casualty Companies, Chicago, is the new vice chairman.

for architects, engineers and contractors...

New Ryerson service on



Dormitory, Michigan State University—28 slabs measuring 44′ x 144′ were poured and lifted into place in just 56 working days. Architect: Lewis J. Sarvis, Battle Creek. General contractor: Christman Co., Lansing. Lifting contractor: Great Lakes Lift-Slab, Chicago.

WHAT THE SERVICE INCLUDES

Now Ryerson offers a unique service (initially covering the Midwest) on planning and building of lift-slab structures. This service includes:

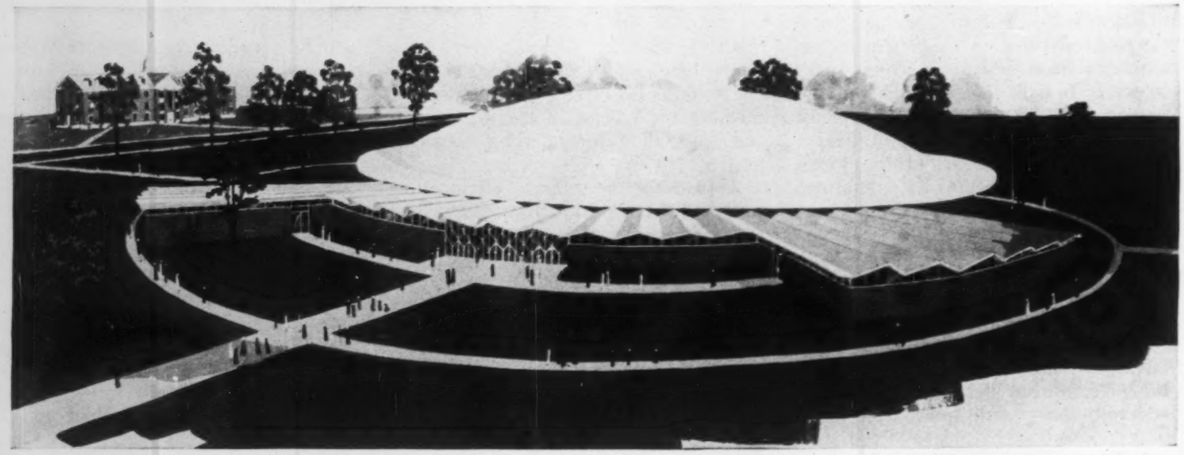
1. Cost data to help you compare the speed, economy and modern efficiency of lift-slab jobs versus alternate methods.

2. Technical manuals on every aspect of lift-slab construction—from planning to detailing and specifying. These manuals, recently revised and expanded by a panel of nationally recognized engineering authorities, provide invaluable reference material for architects, engineers and contractors. No other compilation of data is as complete and up-to-the-minute. Here is a working guide that greatly simplifies the designing and engineering of lift-slab structures. Subjects covered include collars, columns, post-tensioned flat slabs, field procedures, equipment, specifications, etc.

3. Consultation service by a staff of Ryerson specialists with architectural and engineering backgrounds—men experienced in lift-slab and post-tensioned construction.

4. For the contractor, Ryerson can arrange for lifting services using the Youtz-Slick method, and provide a complete package of reinforcing and construction steels—including fabricated re-bars, post-tensioning assemblies, columns, collars, miscellaneous iron, etc.

On these pages are examples of a few current building projects employing the Youtz-Slick method of lift-slab construction. On *your* next job, we will welcome an opportunity to get down to specifics with you. Meantime, if we can furnish helpful information, we will be glad to do so.



300-ft. concrete dome (reported to be the largest of its type anywhere) is the dominant feature of this new auditorium in Anderson, Ind., for the General Ministerial Assembly of the Church of God. Dome was cast at ground level, contoured over a mound of earth. It was then post-tensioned with twelve 40-wire assemblies supplied by Ryerson—and finally lifted into place by the Youtz-Slick method. Dimensions: 250 ft. clear span, with 25-ft. cantilevers for a total span of 300 ft.; vertex of dome 68 ft. above floor level. Architect: Johnson, Ritchhart & Associates, Anderson. General contractor: Lewis Construction Co., Anderson. Lifting: Great Lakes Lift-Slab, Chicago; Sky Hook Lift-Slab, Overland Park, Kans.

lift-slab construction

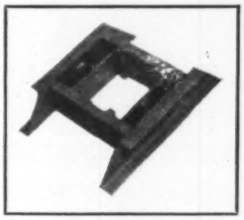
THE LIFT-SLAB TECHNIQUE

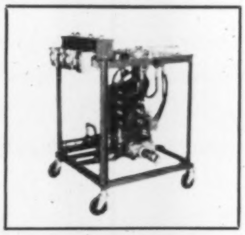
You can do better work for less money, down on the ground than you can in the air.

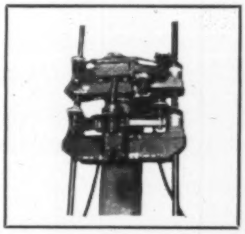
Adhering to this principle, the lift-slab method of construction enables you to pour all the slabs for a multistory building at ground level—one on top of another, separated only by a sprayed-on coating of plastic. The finished slabs are then lifted to the various floor levels by means of hydraulic jacks mounted on top of the building columns and connected to the slabs by alloy steel rods.

The lifting proceeds at a rate of about six feet an hour, and when the slabs are in place steel collars serving as shear heads transmit loads to the columns.

This method of construction is often the fastest and most economical for apartment buildings, dormitories, office buildings and parking structures. The present practical limit for the height of lift-slab buildings is about 20 stories. There is, however, no limit to the size of floors.

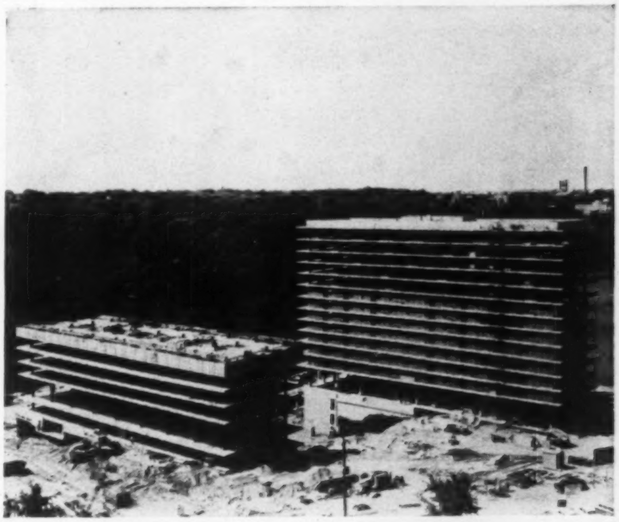

Typical Collar furnished by Ryerson for lift-slab projects. See Ryerson collar handbook for details.


Central Console for controlling the hydraulic jacks mounted on columns, and for programming a slab lift.


Hydraulic Lifting Jack developed by REDCO of Overland Park, Kans., for the Youtz-Slick lifting method.

POST-TENSIONING AND LIFT-SLAB NATURAL PARTNERS

Slabs can be made lighter, stronger and virtually deflection-free by the post-tensioning method of prestressing concrete. Thus the lift-slab method and post-tensioning become natural partners providing safer, stronger buildings at lower cost.


Huron Tower Apartments, at Ann Arbor, Mich. Twin 15-floor apartment buildings. Owner: Huron Towers, Inc., Detroit. Contractor: Long Construction Co., Kansas City, Mo. Architect: King & Lewis, Detroit, Structural engineers: R. H. McClurg Associates, Inc., Detroit; Bob Campbell, Kansas City, Mo. Lifting contractor: Skyhook Lift-Slab Corp., Overland Park, Kans.

Parking structure in Oshkosh, Wis., is the first of its kind in the Midwest to be built with lift-slab construction. Owner: City of Oshkosh. General contractor: William Warner Construction Co., Oshkosh. Architectural and engineering work: A joint venture by Sandstedt-Knoop-Yarbro, architects, Oshkosh—and Charles Nagel and Associates, Inc. architects and engineers, Milwaukee. Lifting Contractor: Great Lakes Lift-Slab, Chicago.

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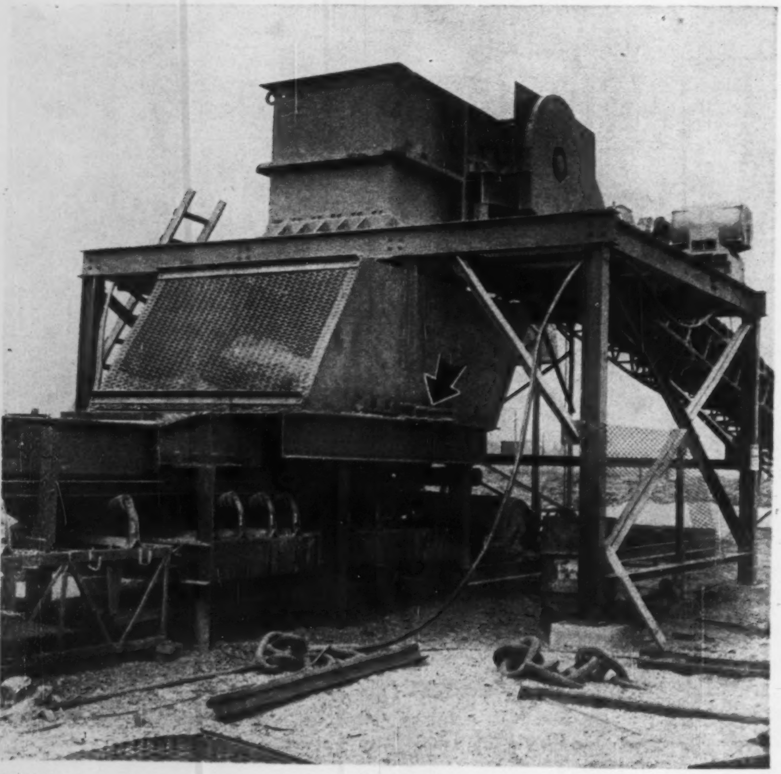
Rock excavation job on New Jersey's Palisades provides fodder for a . . .

Rock Face to Rock Fill: 4 Million



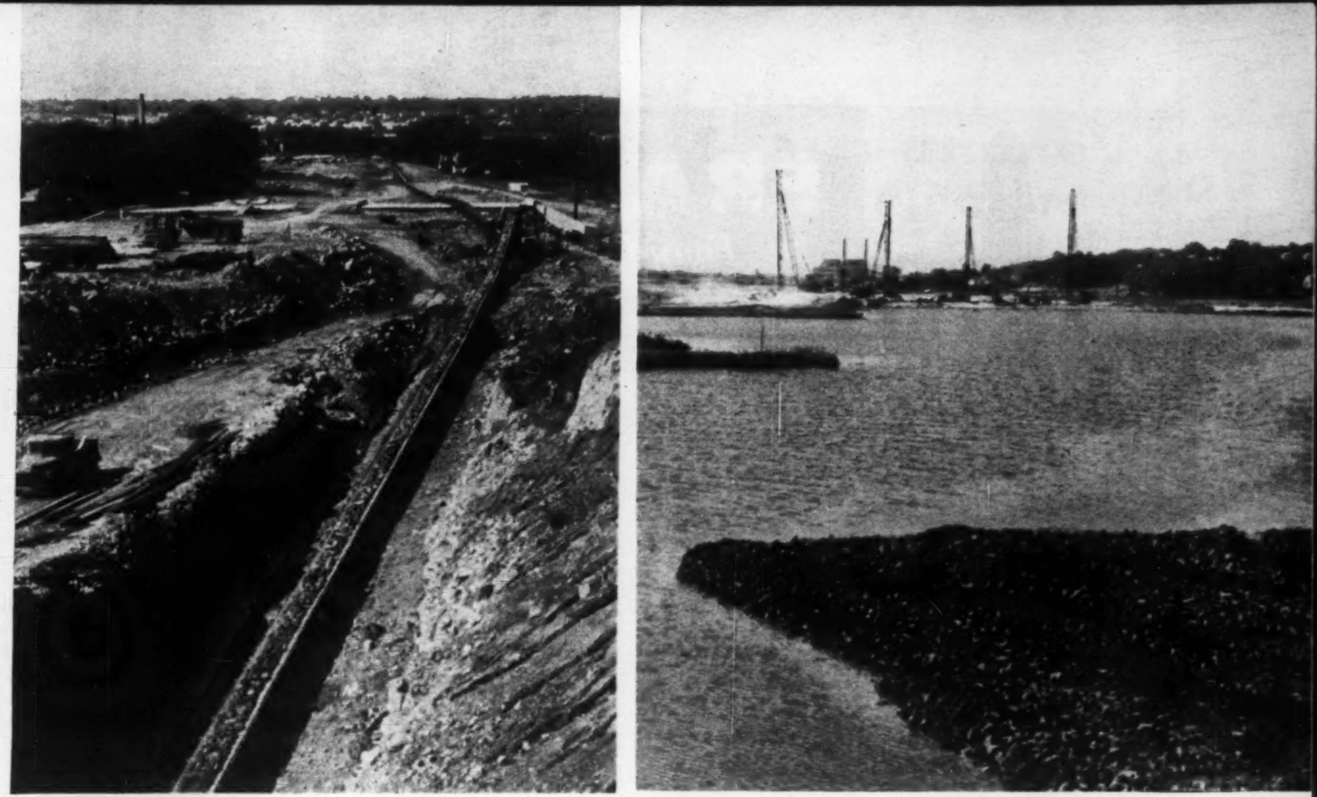
RAILS (arrow) were slid through all transfer bins by the contractor to protect belts and to prevent rock jams that initially plagued the conveyor system.

A two-mile conveyor system plays an important role in the construction of an interchange on Interstate 95 in New Jersey. It's carrying more than 3,750,000 tons of rock from a gyratory crusher high on a hillside near the George Washington Bridge to the bottom of the hill, across several major roads, a railroad, a stream and more than a mile of swampland. It then spills its load into two high truck-loading bins standing beside a man-made lake that is being filled in to carry the bridges, roads and ramps of the interchange.

And the conveyor delivers rock for ten hours a day, six days a week in quantities of up to 2,000 tons per hour.

Conveyors have long been used in mining, tunneling and dam-building operations, but few highway projects are so designed and so situated as to be amenable to their use. New Jersey State Highway contracts No. 95 Sections 1E & 1G are among those few.

George M. Brewster & Son of Bogota, N. J., has contracts worth $18 million to construct a 10-lane highway across some four miles of swamp and to build a complex interchange between I 80, which will run across northern Jersey between the Hudson River and the Pennsylvania line, and I 95, which



conveyor that's helping to fill a 9-acre . . . lake at the site of a highway interchange

Tons Ride a 2-Mile Conveyor

will connect with the New Jersey Turnpike.

Included in Brewster's contracts is the installation of 5.7 million ft of vertical sand drains and the placing of 1.5 million cu yd of sand fill. Also, Brewster must fill with crushed rock a 9-acre lake that was dredged, under a separate contract, to depths of up to 35 ft to clear the interchange area of unsuitable material.

• Delivering the goods—The contractor bought the sand for the drains and the fill, shipped it by rail to a siding near the job, spilled it into a hog box and then pumped to the right-of-way.

The rock posed a different set of problems.

Brewster has plenty of rock. As part of its work on several nearby projects, most of them in the Palisades (basaltic cliffs along the Hudson) at and near the George Washington Bridge, it has more than 4.5 million tons of excavation.

The problem is getting the rock from the excavation areas to the lake. Truck haulage for the full distance between the sources of supply and the dump area would be difficult, expensive and against public interest. The Route 95 right-of-way, which connects the points, is now mainly hydraulically placed sand. It has in it several bridges that are not yet completed, and there are other items required on it. Trucks using the right-of-way would be slowed by the sand, would have to detour through city streets around the uncompleted bridges, and would generally clutter the work area.

The full use of city streets would be even less plausible. For the most part they are narrow, heavily trafficked, and well spotted with signal lights. On the most direct route there is a mile-long hill with grades up to 18%.

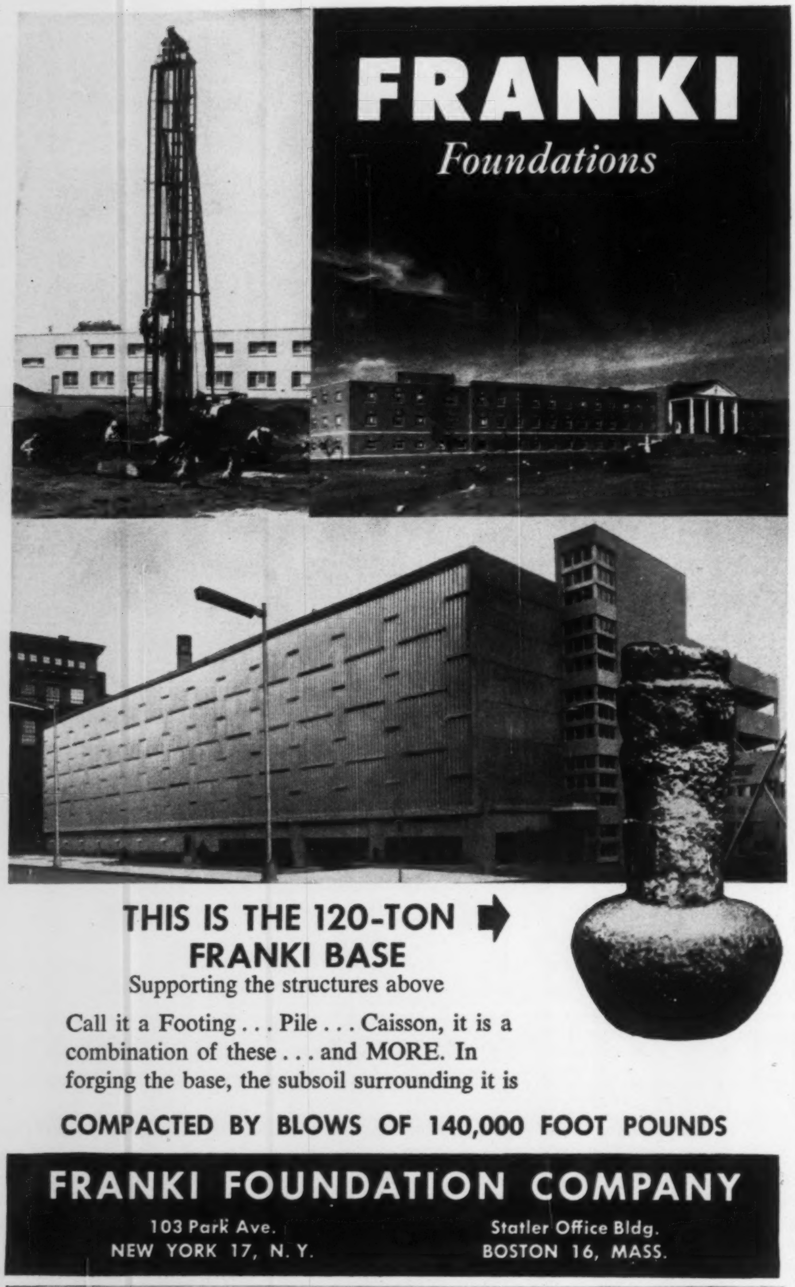
These conditions posed difficult—but surmountable—problems for the contractor. However, there was an even more important consideration — a human factor. The area is densely populated and has several schools and a hospital on or near the roads that would be used by trucks. The congestion, confusion, dust and noise resulting from the over-the-road hauling of the rock would make life almost unbearable for the local residents.

• Solving the problem—In the conveyor, Brewster saw a way to avoid most of these difficulties. It also saw some advantages—most of them economic. The initial cost of the conveyor system, estimated at about $1.5 million, is about the same as the cost of the trucks that would have been needed, but company men expect that the salvage value of the conveyor will be greater. Operating costs of the conveyor are less, maintenance is lower and fewer men are needed for its operation. Furthermore, in the area covered by the conveyor there is no need for traffic control and no need for sweeper trucks or cleanup crews.

Brewster retained Willis & Paul, Branchville, N. J., contractors to engineer, purchase and erect the crusher and the conveyor system.

The crusher, a gyratory unit capable of producing minus 8 in. stone at the rate of 2,000 tons per hour, stands at the eastern end of the system. Proximity to the excavation areas and general accessibility determined its general location. Its specific location was selected because of topography that made it possible to set the plant at the edge of a sharp incline on the hillside.

The dumping platform is at grade on the high side; the conveyor comes in through a shallow cut from the low side. The contractor took advantage of land contour to eliminate truck ramps to the dumping chute and to reduce the excavation needed to get the con-



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veyor belt under the gyratory crusher.

Most of the conveyor system components are standard equipment. The belt that takes the rock from the crusher is 60 in. wide but the belts on the other nine flights are 42 in. wide. Conveyor trusses are 24 in. deep, rollers are all 5 in. in diameter with ¾ in. shafts. Troughing idlers are set 4 ft on centers, return rollers are 12 ft on centers. Head pulleys are 36 in. in diameter; tail pulleys, 30 in. Gravity take-ups maintain belt tension.

While the components are standard, the final set-up is not; it reflects engineering and modification demanded by specific job conditions.

The system is 11,400 ft long. It stands entirely on the Route 95 right-of-way in ten flights ranging from 50 to 2,000 ft in length. The flights conform to the semi-circle made by the right-of-way through the area. Most of the trusses are close to the ground on 12 x 12 timbers or low concrete piers, but at transfer points and crossings sections of them are elevated. At the inclined approaches to the transfer points and the truck bins diagonally braced steel bents supported the trusses. At the rail, road and stream crossings, the contractor built bridges. The bridge across the Overpeck Creek, which has a 70-ft span, has a timber deck supported by four 30WF 99 beams. The bridges at the road and rail crossings have through trusses.

• **Troublesome transfers**—One of the most important modifications of the basic equipment involved changes in the transfer bins. The bins, as originally set up, were a source of considerable trouble. Job conditions at several points required long drops for the rock passing from one belt to the next. (At the rail crossing the drop is 16 ft.) The long rock falls played havoc with the equipment and made maintenance a serious problem. In addition, it was found during the initial testing of the system that the rock was jamming on the belt within the transfer bins.

After several days of study and experimentation, the contractor arrived at a relatively simple but effective solution to both problems:

He lengthened all the bins by about two feet, cut from 5 to 7 holes through the bin sideplates just above the bedframe and slid short sections of railroad track through the holes so they spanned the bin and rested on the bedframe. Rock falling from the upper belt strikes the rails before sliding onto the lower belt. In addition, the spread of the rails is wide enough to hold appreciable quantities of rock, which serves to cushion the impact further. The added bin length permits the rock to slide off the rails onto the belt.

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When 91 years of engineering and experience go into a **sewage pumping device,** there can be only one result—an ejector that is so much in a class by itself, it becomes an "institution" . . . a piece of equipment that keeps other ways of handling sewage **perennially obsolete** . . . a mechanism that makes embarrassing service interruptions and dangerous climbing in-and-out of manholes things of the past. Each part, each material, each contour, each surface of the Shone ejector has significance in the vital job of handling sewage.

1. Consider the **mirror-like** "superfinish" (you can **actually shave** in it) surfaces of the pilot valve slides and seat of the Shone's exclusive control system. Hand-lapped to perfection... only the weight of the valve slide plus pilot air pressure maintain the seal for decades of operation. Faces of the two parts fit so accurately that it is actually difficult to pull them apart. There is no leakage... opening and closing are truly positive. Parts do not wear "out of balance," because they are "broken in" before leaving the factory.

2. Piston valve and **pistons** are also "superfinished" to the same mirror-like surface . . . and a test of **each** valve assembly assures operation at only 60% of the **minimum** allowable pilot and operating pressure.

3. Or consider the singularity of **rectangular** valves in round pipes. Sticks and stones in sewage may "bridge" in a round pipe under low-flow conditions. Not only are the Shone's valves rectangular, but they have a larger internal cross section than the pipes to which they are connected. This is one of several reasons why **nothing** (but nothing) can choke a Shone ejector in this "bottleneck" spot. Anything which reaches the receiver passes through it and through the discharge valve.

4. We all know cotter pins are fine on tricycles (and on **external** linkage), but not inside pneumatic ejector inlet and discharge valves. You can't find a more perfect snagger for rags and other strangulating debris. Shone has flush-driven pins on valve hinges, another tremendous trifle.

5. A newly-cast, iron receiver, like any good whiskey, needs to be aged. Receivers for Shone pneumatic ejectors are "mellowed" for up to one year. This settles them down, prevents cracks and warping by relieving internal stresses in the crystal structure. Remember that Shone sewage ejector installations are usually considered permanent — the **first U. S. installation, 1889, is still in service.** An important invisible extra!

6. There are no "missing links" in the control linkage assembly of a Shone ejector. **Each** assembly is set, tested, dowled, and "match-marked" for its **own** particular receiver assembly. No trial and error fitting on the job. Another Shone "intangible" asset.

7. Tipsy control rods are obviously going to be less than 100% efficient. Shone bell rods are sober, straight, and only work with or against the forces of the bells and gravity. There is **no** side thrust to deform the packing seal. A trifle? No, a reason why Shone packing boxes go **years** without repacking.

8. Today, nothing is truer than "time is money." A special cast iron header, job tailored for each unit, holds field fitting, pipe cutting, etc., to bare necessities. Duplex units are complete with cross connections. The installer spends his time installing!

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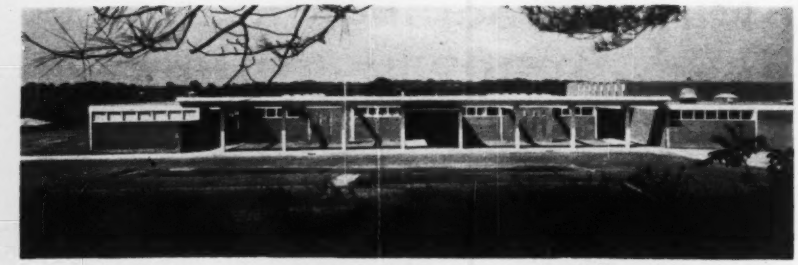

MIDWAY SCHOOL, DeKalb County, Ga., shown in design exhibits, cost $11.79 a sq ft.

PEACHCREST SCHOOL at $11.08 per sq ft also typifies quality schools of DeKalb County.

School Construction Costs Can Be Cut

Georgia's DeKalb County, just east of Atlanta, builds schools for about $2.43 less per sq ft than the rest of the South, and about $4.14 less than the Northeast.

Allowing for differences in mechanical needs and lower costs due to climate, DeKalb County still beats the South by $2.24 per sq ft and the Northeast by $3.58.

How does the county save so much in school construction costs?

"Saving on school construction costs demands comprehensive planning combined with hard-headed business management," says Jim Cherry, superintendent of schools.

"Saving on school construction costs is basically a matter of attitude. It must be shared by the architect, contractor and school department alike," says Melvin Davis, DeKalb County director of School Plant Services.

Mr. Cherry and Mr. Davis have different answers. But working together they got the same results: seven new schools and 14 additions to existing schools at a median cost of $11.27 per sq ft.

• The battle for lower costs—The groundwork was laid in 1947, when county citizens realized the population was exploding. Officials reckoned that school enrollment would make three ten-year leaps above the 1940 enrollment, to 20,000, 45,000 and 80,000.

To develop a plan for expansion and improvement of facilities, the county hired Jim Cherry as a consultant. At the time, Mr. Cherry was working for the State Department of Education.

Mr. Cherry launched into a five-step improvement program:

- A seminar to isolate problems and outline a program.
- Study-group meetings, to get taxpayers interested.
- Public tours of schools.
- Meetings with architects, contractors, manufacturers and distributors to gather ideas on economical construction.
- A newsletter keeps citizens informed.

In 1948 alone, 35 study-group meetings were held. In less than eight months, over 100,000 persons discussed school construction problems at these meetings. And virtually no civic or professional group was overlooked as a means of reaching the people.

• Organization for the battle—While Mr. Cherry was establishing a climate that would nourish business-like management of the school program and community cooperation, he also set up a three-part team to get the actual program under way. The team consisted of an Architectural Advisory Council, the School Building Survey Committee, and the director of School Plant Services, Melvin Davis.

The Architectural Advisory Council consists of architectural firms, usually about 16, that have worked on county schools. New architects join the council as they receive work contracts, replacing members who are dropped. The architect for a new school is expected to call upon other members of the council for suggestions. The main function of the council, however, is to evaluate cost-cutting changes or additions to the county's Minimum Construction Standards.

The School Building Survey Committee is composed of a group of subcommittees, each assigned to a specific group of schools. When a new bond issue is approved and plans are made for building the schools it will pay for, a new subcommittee is appointed.

Each subcommittee includes faculty members, custodians, architects, mechanical engineers and contractors. The primary purpose of the group is to evaluate schools after they have been in use and to offer suggestions for needed changes in the county's Minimum Construction Standards.

During its three-year term, the subcommittee gathers these suggestions as schools go into use. At the end of its term, the group sifts through all ideas received. The best are recommended to the Architectural Advisory Council.

Melvin Davis serves as coordinator, providing liaison between architects, contractors and school department. A former industrial arts teacher, Mr. Davis interprets specifications and exercises supervision over purchasing, maintenance and construction.

His most significant contribution to DeKalb's lower-cost schools is his procedure for working with the low bidder:

"Contractors around here know that we expect them to help us find ways of trimming something off their best bid. In spite of this," says Mr. Davis, "they like to work with us, because they know we're going to deal with them fairly and on a strictly professional basis. One contractor recently took on a $500,000 job with only a 3% margin to work with. The majority of cost-saving ideas originate with the contractors themselves."

Virtually never is the amount of a low bid the final cost in DeKalb. As soon as bids are opened, Davis and the architect on the job sit down with the low bidder and go over every aspect of the plans. Says Davis, "They know I'm going to keep searching until we come up with significant, satisfactory ways of cutting costs."

• Cost-cutting suggestions—Here are several examples of cost savings credited to the School Building Survey Committee:

- A teacher's suggestion that open shelves be substituted for drawers resulted in a saving of $20 per classroom.
- Another teacher-member of the committee suggested that one 3-ft-wide cabinet door be replaced by two 1½-ft-wide doors. This not only trimmed maintenance costs, but saved up to $4 on each cabinet installed.
- A lunchroom supervisor suggested that the pre-rinse, automatic-conveyor-type dishwasher be replaced by a manual system having a separate pre-rinse sink and no conveyor. The manual system works well, and saves up to $1,000 per kitchen installation.

Here are two cost-cutting ideas typical of Davis' contributions:

- Instead of precast concrete panels with a quartz facing on the outside, Davis suggested a brick wall glazed with tile on the inside. This eliminated painting and decreased maintenance. Estimated savings: $1,294.
- Plastic skylights substituted for wire-reinforced glass saved $700. Mr. Davis discovered that breakage is not as great as previously estimated.

Now, when DeKalb tallies its cost-saving steps the final score for individual schools looks like this:

Sequoyah School was contracted for $451,248 with a savings of $1,016 on completion this year. Sagamore Hills School yielded a $6,070 savings on a $477,990 low bid.

Midway School, $200 on $364,252 bid; and Laurel Ridge, $1,124 on $373,639 bid. And Briarcliff High yielded savings of $2,129 and $8,193 on two contracts bid at $430,910 and $1,347,807, respectively.

These cost figures become even more significant since these schools have been selected at least once by architectural and educational associations for public exhibition on the national or the international level. That's what DeKalb citizens mean when they say quality schools at low cost.

the man who backs his skill with Mobile Drill has a head start on any job he wants!

B-40 DRILLS 110′ WITH 4″ AUGERS, MAKES 15 PENETRATION TESTS EACH EIGHT HOURS

"Foundation testing job for the Air Force Academy was completed rapidly and economically," says Jack W. Shy, Field Engineer of Testdrill Inc., Colorado Springs, Colorado. "Split-spoon samples were taken every 6′ to about 70′ depths in Dawson-Arkose (90 to 100 blows per foot with 140 lb. hammer)."

New Mobile Drill Catalog No. 615 available on request.

Hydraulic-powered, multi-purpose B-40 EXPLORER owned by Testdrill Inc. has given over 500 hours of continuous, maintenance-free operation.

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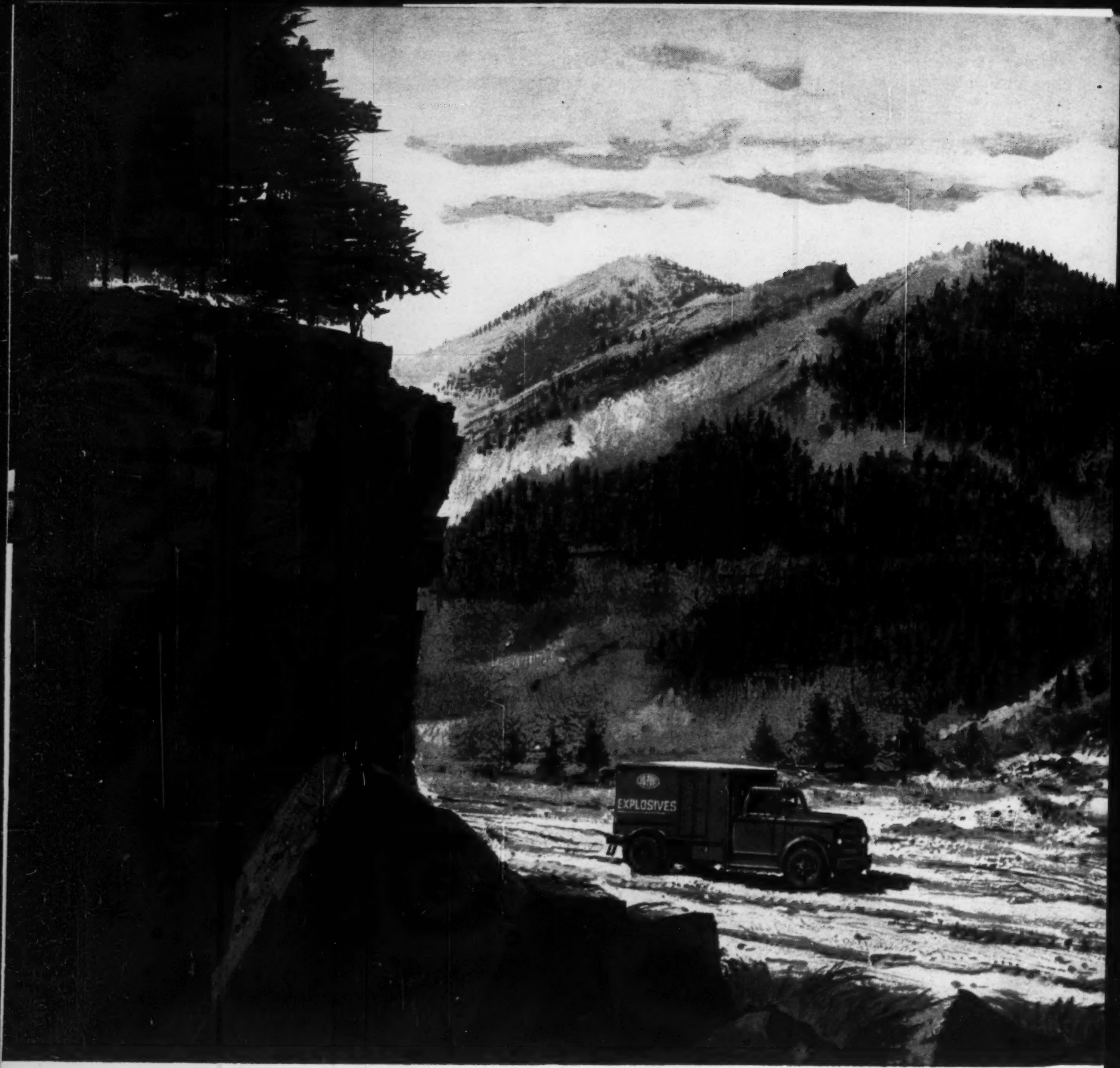
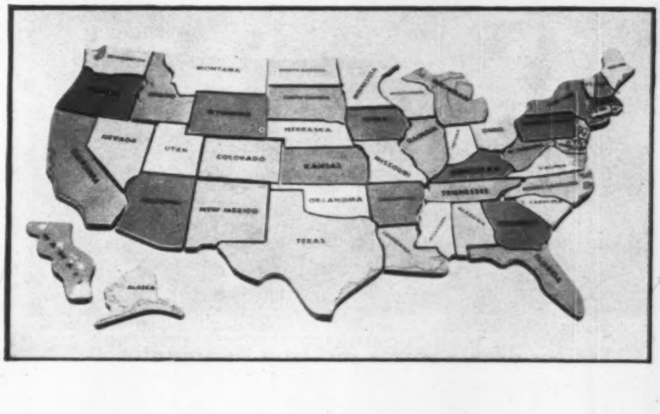


Wherever your contract takes you there's a supply of Du Pont explosives nearby

In fact, 819 Du Pont explosives distributors, district offices and plants blanket the United States from coast to coast, border to border.

Your project can cut through rock and rough terrain *without delay for explosives,* because you're always within fast delivery time of a Du Pont supply.

FREE KIT gives locations, names, addresses, day and night telephone numbers of Du Pont's distributors, district offices and sales representatives. Includes map showing locations at a glance, a Directory by states, product information, file folder . . . and an envelope to protect all this useful material.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EXPLOSIVES

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT
REG. U.S. PAT. OFF.

Grader and rotary mixer team up to aerate local aggregates

How They

Kansas wants its heavy duty asphaltic pavements deep and strong. And it gets them that way.

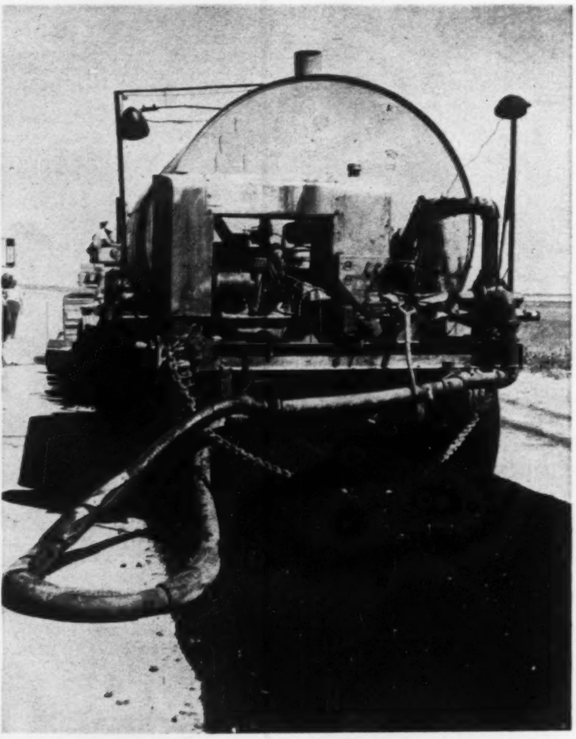
On a 21-mile piece of Interstate 70 in western Gove County, Kansas has one of its best—and at present, most prominent—contractors paving $3.8 million worth of 16-in. pavement on compacted subgrade. The roadbuilder is M. Clare Miller, president of San Ore Construction Co. and currently president of the Associated General Contractors (ENR Mar. 9, p. 86).

San Ore puts 12 in. of bituminous base on top of the compacted subgrade to support 4 in. of hot-mix asphaltic concrete. They give outside shoulders of the 4-lane divided highway a 6-in. pavement—3 in. of bituminous base and 3 in. of bituminous mat surfacing (plant mix). And Kansas is experimenting with partial-width paving of inside shoulders on this job.

The drawing on the facing page shows just how hefty the pavement is.

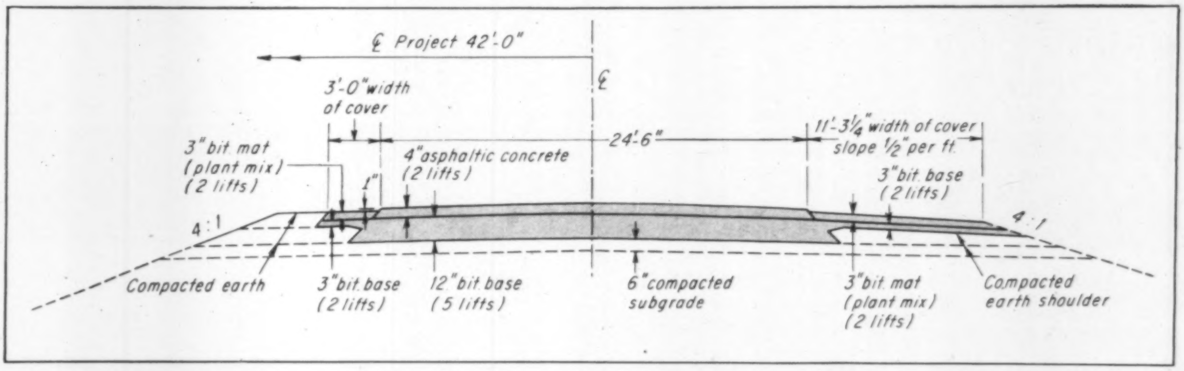
San Ore's superintendent on the project, Everett Davidson, is producing bituminous base by both road mixing and plant mixing—and comparing the two methods for their advantages and disadvantages.

Tractor-drawn mixer picks up aggregates . . .



adds asphalt and discharges paving mixture.

Pave for Heavy Duty in Kansas


℄ Project 42'-0"
℄
3'-0" width of cover
3" bit. mat (plant mix) (2 lifts)
1"
4" asphaltic concrete (2 lifts)
24'-6"
11'-3¼" width of cover slope ½" per ft.
3" bit. base (2 lifts)
4 : 1
4 : 1
Compacted earth
3" bit. base (2 lifts)
12" bit. base (5 lifts)
6" compacted subgrade
3" bit. mat (plant mix) (2 lifts)
Compacted earth shoulder

Typical half-section shows multi-layer construction of 16-in.-thick asphalt pavement.

Here's how the paving goes:

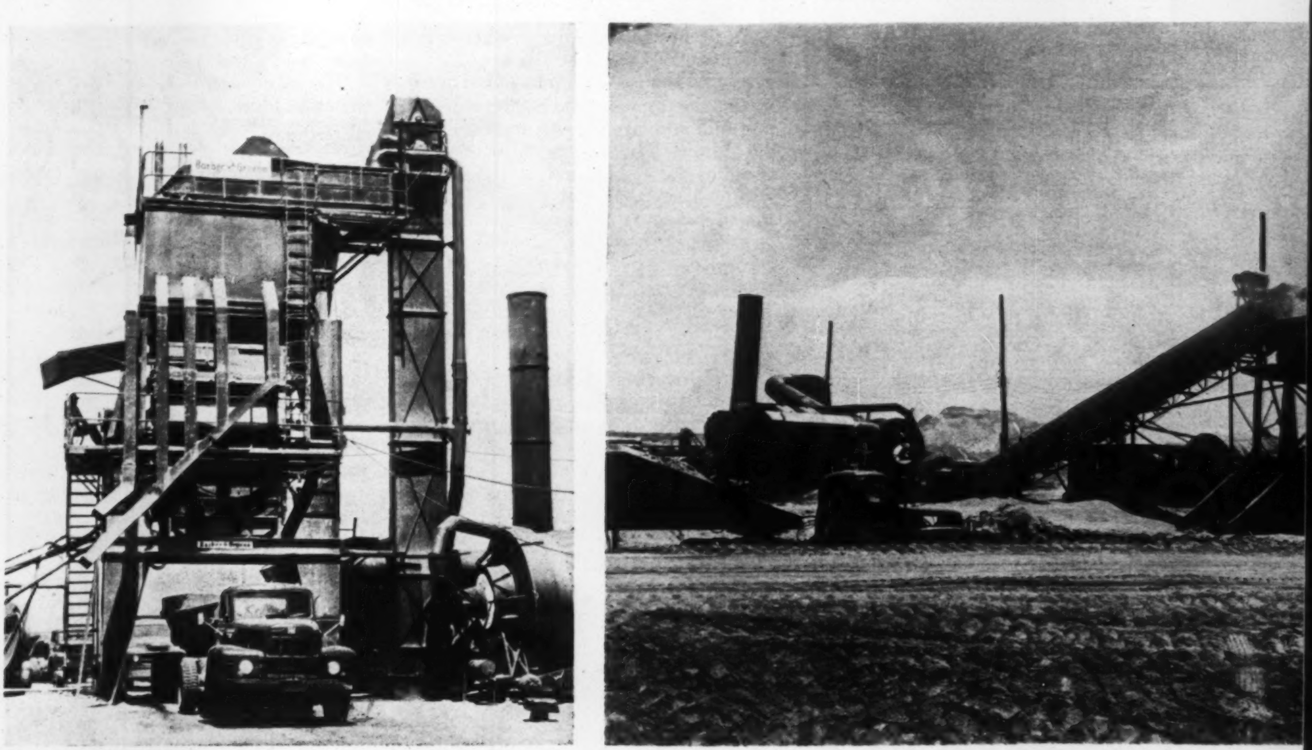
- **The bituminous base**—The bituminous mixture used in the base course is essentially sand-asphalt using medium-curing cutback asphalt (MC-4). Maximum size of aggregate is 1 in., and most of the material passes a $\frac{3}{8}$-in. sieve; specifications permit from 1 to 30% of the material to be retained on the $\frac{3}{8}$. From 88 to 94% of the aggregate is retained on a No. 200 sieve.

Plasticity index of the material can vary from 0 to 6.

Aggregate is sand and gravel from various nearby locations. In Kansas, the contractor has to find his own aggregate for asphalt paving. Clare Miller's men made several thousand borings before finding and leasing borrow areas for this job.

The most difficult part of the aggregate specification to meet, says Mr. Miller, is the so-called effective fines requirement. This sets the relationship between the quantity of fines (passing No. 200 sieve) determined by the standard decantation (wash) test accompanied by dry screening in the laboratory and the same quantity determined by a dry screening test of the windrowed material on the roadway when it is ready to be mixed with the asphalt.

After pulverization of the mixture (BC-4), "not less than 40% of the total minus No. 200 mesh material as



Batch plant produces hot base course mixture . . . as does this simpler continuous-flow plant.

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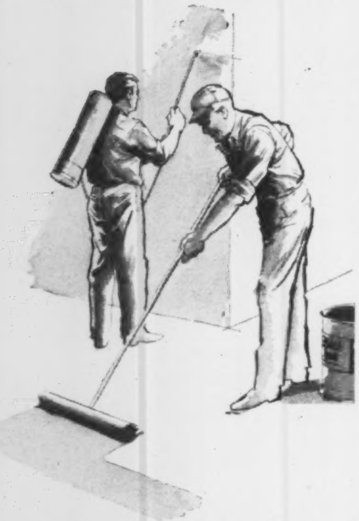

. . . cure, chemically harden, seal and dust-proof concrete in one application—

Sealtight "Cure-hard" reacts chemically *with* and *becomes an integral part* of the concrete to create a hard, dust-free surface that will last indefinitely . . . *not* just a surface coat that quickly wears away. Ideal for curing and chemical hardening of exposed floor slabs, walls, beams, columns, sidewalks, ramps, etc. . . . also used to provide a hard, dust-free surface on all concrete floor slabs to be covered by resilient flooring . . . assures a perfect base for adhesion of linoleum, asphalt, vinyl, and rubber tile. Available in "Clear" type that leaves no residual coloring on the concrete, and Tempo-rary-Dye type that leaves a temporary greenish cast on the concrete for visual identification of application.

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- Effectively cures concrete . . . water retention rating exceeds ASTM requirements.
- Penetrates .04 to .08 inches to chemically harden concrete and provide a hard finish that will last indefinitely. Appearance actually improves with traffic.
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- Resists sticking of concrete and mortar drippings . . . resists penetration of oils and chemicals.
- Safe . . . noninflammable and nontoxic.

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determined by washing and dry screening shall pass the No. 200 mesh sieve by dry screening before washing."

The Kansas State Highway Commission is quite explicit on what it wants in its fines requirements—and why.

State Highway Engineer Walter Johnson says, "On a project where road mix methods are used, fine materials naturally occurring in the aggregates are permitted in the final mixture as mineral filler. Almost always there is some agglomeration of the fine and coarse materials.

"When the gradation of the material is determined by washing, the fines are generally reduced in the washing process to their normal size; however, in mixing and pulverizing the same material on the road in the windrow, it is normally impossible to attain the same degree of pulverization or separation by these methods as indicated in the standard wash test.

"The effective fines requirement assures that some minimum amount of fines is present in the windrowed material."

For the contractor, this often means that mineral filler—silica sand—must be added to the local aggregates.

• By road mixing—The key to profit on bituminous base construction lies in the hand of the highly skilled motor grader operator, says Clare Miller. His San Ore operators are good, and they're using powerful graders with automatic slope controls..

Heart of the road-mix operation is a self-propelled machine that picks up aggregate from a windrow, adds asphalt, mixes the asphalt and aggregate in a pug mill and lays the mix back down in a windrow. The road-mixed base course contains 4.2% bitumen.

Step-by-step, to put down the road-mixed pavement, Clare Miller's men:

- Reshape the subgrade, check compaction and re-compact as necessary. (Grading and structures were completed last year on other contracts.)
- Dump the aggregate for a 3-in. lift on the subgrade.
- Aerate the aggregate. (San Ore uses rotary speed mixers, spring-tooth harrows and motor graders to reduce the moisture content of the aggregate to less than 4%.)
- Use motor graders and a windrow evener to shape the windrow to known dimensions.
- Pass the material through the traveling pugmill mixer. (When the weather is right, this machine can process one mile of material in about five hours.)
- Aerate the mixture to remove volatiles from the asphalt.
- Lay the mixture down with motor graders. (Here's where the skill of grader operators pays off.)
- Then, compact with pneumatic-tired rollers to the specified density.

Superintendent Davidson repeats this basic process for three lifts of bituminous base directly beneath the roadway. He applies a tack coat of rapid-curing cutback asphalt (RC-3) between each two lifts.

After building up the base to 9-in. thickness, San Ore crews place the earth shoulder on both sides. They then cut the fillets (see drawing) at the edges of the shoulder and apply a 1½-in. thick layer of base course material over the roadway and paved shoulder area. A second 1½-in. lift completes the base course over the width of the roadway and paved shoulders.

• By plant mixing—San Ore uses two hot-mix plants to produce base course material—with 4.5% bitumen. One comprises a dryer, dust collection system and pug mill mixer. Its production is about 185 tons per hour. The other is a 225-ton-capacity batch plant fed by proportional feeders and belt conveyors. This second plant will be used to produce the surfacing mixtures.

Plant mixing has two big advantages over road mixing, says Clare Miller. It is less dependent on weather conditions, and the mix is more uniform. In wet weather, plant mixing has a definite cost advantage over road mixing. In good weather, road mixing may be a little cheaper.

On the road, steps of aerating, spreading and compaction of the plant-mix base course are essentially the same as for road mixing.

The bituminous mat used to surface the shoulders incorporates the same aggregate (BC-4) as the base course; it is plant-mixed. However, the binder is 120-150 penetration grade asphalt cement.

• The asphaltic concrete—The asphaltic concrete roadway surface comprises two 2-in. lifts of closely graded mixture, 1-in. maximum size of crushed stone or crushed gravel. The binder is 85-100 penetration grade asphalt cement. The mixture contains less than 7% by weight of asphalt cement.

San Ore will place the lifts of asphaltic concrete between the completed shoulders, using conventional asphalt pavers. Kansas procedures call for breakdown rolling with an 8- to 10-ton tandem roller; intermediate rolling with a 25-ton pneumatic roller; and final rolling with a three-wheel roller. Specified density is 95% that obtained in the laboratory by the Marshall method.

T. W. Hicks is district engineer for the Kansas Highway Commission, with headquarters at Norton. Roscoe Wall is resident engineer on the $3.8-million job.

ALLIS-CHALMERS FLEET

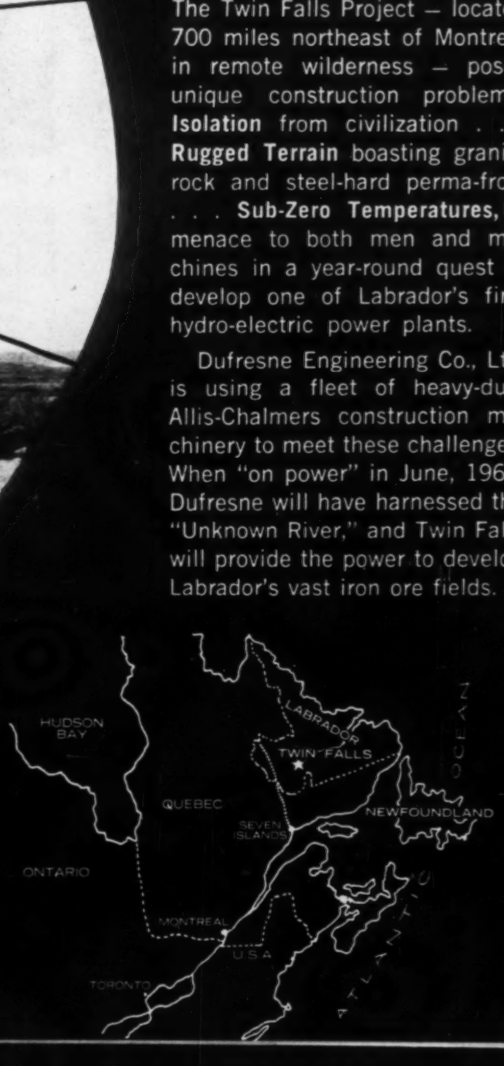
tackles central Labrador wilderness... ...helps develop area's first Hydro-Power

SPECIAL REPORT

TWIN FALLS, LABRADOR

The following pages unfold one of the most dramatic new developments of hydro-electric power in the North American continent. The Twin Falls Project — located 700 miles northeast of Montreal in remote wilderness — poses unique construction problems: **Isolation** from civilization . . . **Rugged Terrain** boasting granite rock and steel-hard perma-frost . . . **Sub-Zero Temperatures,** a menace to both men and machines in a year-round quest to develop one of Labrador's first hydro-electric power plants.

Dufresne Engineering Co., Ltd. is using a fleet of heavy-duty Allis-Chalmers construction machinery to meet these challenges. When "on power" in June, 1962, Dufresne will have harnessed the "Unknown River," and Twin Falls will provide the power to develop Labrador's vast iron ore fields.


HUDSON BAY
LABRADOR
TWIN FALLS
QUEBEC
NEWFOUNDLAND
SEVEN ISLANDS
ONTARIO
MONTREAL
U.S.A.
TORONTO
ATLANTIC OCEAN

TWIN FALLS, LABRADOR
Population: 523 (approx.)

The construction of five earthfill dams to impound the swift waters of the Unknown River began in late 1960. Over 1½ million yards of abrasive glacial "till" and boulder-ridden gravel will be moved to direct 2,000 cu ft of water per second through twin 15-ft-diameter penstocks into the powerhouse . . . located at the base of a 300-ft-high sheer granite cliff. Each dam site is cored out to bedrock or satisfactory foundations. Then "till" and gravel are used alternately to bring each dam up from a 150-ft-wide base. The 3-to-1 upstream slopes are rip-rapped with large granite boulders. The 2½-to-1 slopes on the downstream side of each structure are blanketed with coarse gravel. When completed, Twin Falls will generate 120,000 horsepower . . . most will be transmitted 110 miles west to an iron mining operation. Provisions are being made — anticipating future demands — for additional unit installations. The impoundment could supply enough water for five penstocks, each capable of generating 60,000 horsepower.

"HD-21s have been our 'bread and butter' machines from the outset . . . our twelve TR-260s have given us good performance and availability."

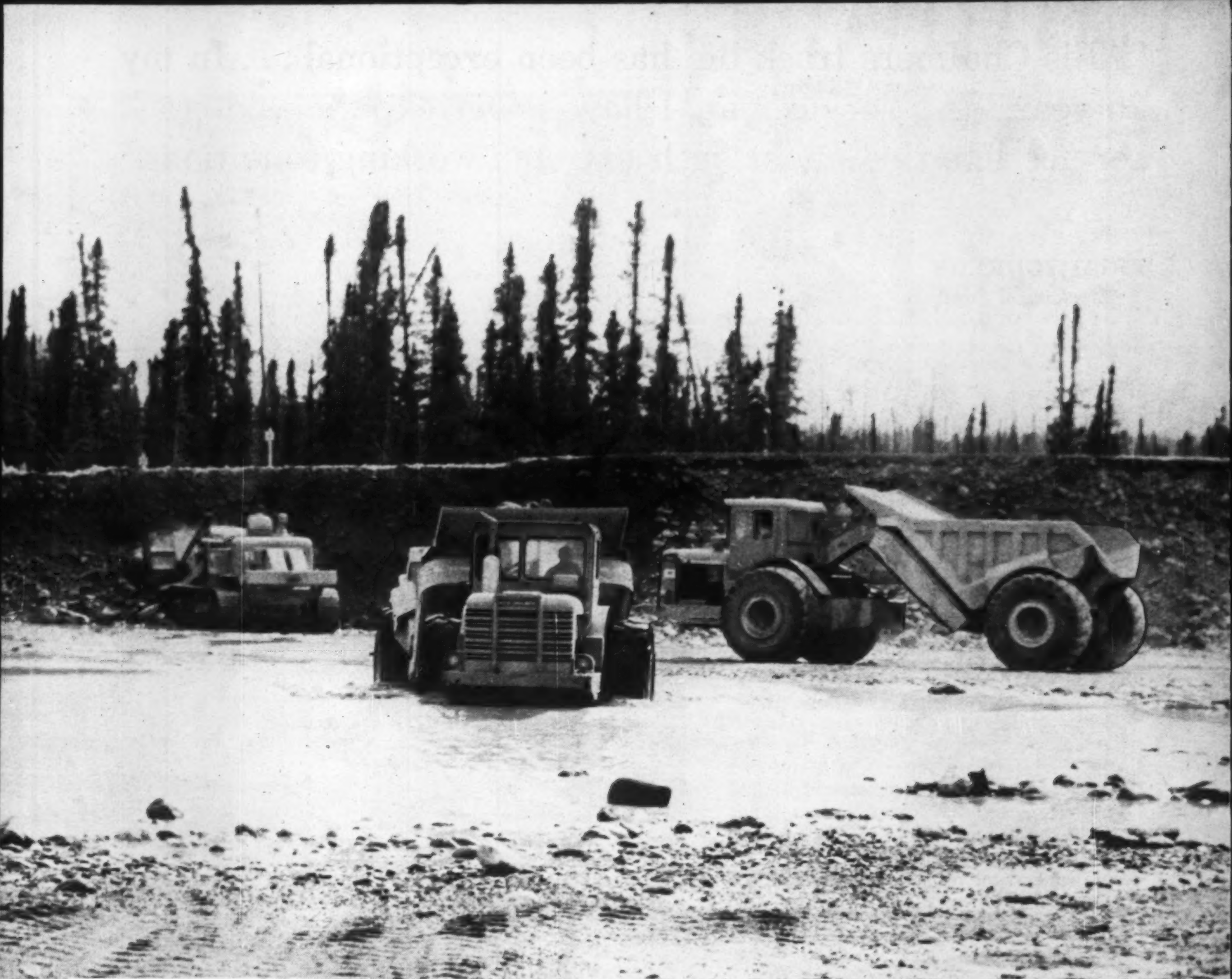
STEVE REVAY, *Project Manager*
Dufresne Engineering Co., Ltd., says:

"TR-260s are giving us better *over-all* performance than any other machine we could have chosen. They're agile, maneuverable . . . they adapt well to a variety of working situations, and have given us very good performance and availability from the start."

"The HD-21s have been our bread and butter machines from the outset because progress depended on them. They stand the pace very well . . . the tracks have given us considerably more life than we had anticipated in this country."

Steve Revay keeps over 400 workmen busy on two 10-hour shifts . . . besides keeping equipment working efficiently on scattered job sites. His operation is presently rolling at high gear . . . earthmoving is 50% complete, and the project is running on schedule.

Two HD-21s place granite rip-rap on the face of Dam No. 4. One, equipped with rock rake, combs boulders out of the "till" fill. Torque converters have helped keep tractor availability high by absorbing the load shocks encountered in work like this.



Loaded with 20 tons of bank-run gravel, one 230-hp TR-260 wades through shallow water while another pulls into loading position. 150-hp torque converter-equipped HD-16G tractor shovel loads 3 yd at a clip . . . keeps wagons moving out steadily on 2½-mile haul to dump site.

Allis-Chalmers Model 45 motor graders are used around the clock to keep the more than 25 miles of project roads in tiptop shape. Smooth haul roads permit heavily loaded TR-260s to highball from pit to dump at speeds up to 30 mph. An Allis-Chalmers TL-16 rubber-tired loader tends aggregate stockpiles and keeps utility chores of all kinds cleaned up around the project area.

This rugged HD-21 angle dozer has over 2,400 hours of muck, rock, abrasive "till" and perma-frost work under its belt . . . is still operating on its complete, original undercarriage. Here, the 225-hp crawler is swamping out a mucky mixture of "till" and water in a coring-out operation on Dam No. 1.

"Allis-Chalmers track life has been exceptional . . . In my 25 years as a serviceman, I have never experienced track service like this under such extreme working conditions."

FRED YORKERS
Mechanical Supt.
Dufresne
Engineering Co., Ltd.

"Track life on all these crawlers has been exceptional. I have been a serviceman in this part of the world for 25 years, and I have never experienced track service as good as this under such severe working conditions." The Dufresne Company's decision to "run the track into the ground" is the result of practical reasoning. The extreme high cost of transporting track components to and from the "outside world" for proper rebuilding would be more prohibitive than complete replacement when necessary.

It also makes good sense when you can get track performance *like this*: To date, five HD-21s (two equipped with rippers) have ripped and dozed a total of 12,020 hours. Replaced parts during this time: *One* front idler shaft — *One* set of pads for a ripper-equipped "21" that saw extreme wintertime duty in boulder-infested perma-frost.

Fred Yorkers keeps a watchful eye on every machine. Preventing trouble through proper maintenance is the prime goal of Yorkers and his 14-man service crew. Including Company personnel vehicles, the Service Department tends over 80 separate machines at Twin Falls.

HD-21	**TR-260**	**45 Motor Grader**	**HD-16G**	**TL-16**
225-hp	230 hp	127 hp	150 hp	109 hp
50,000 lb	20-ton capacity	24,000 lb	3-yard capacity	up to 4 cu yd

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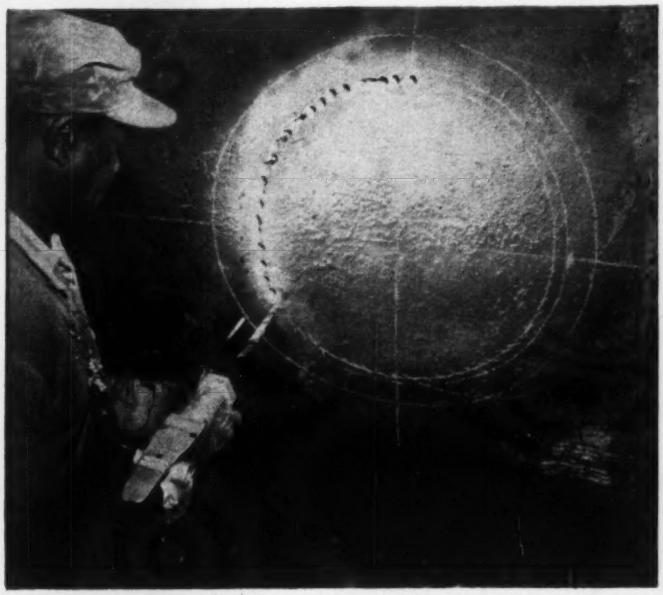
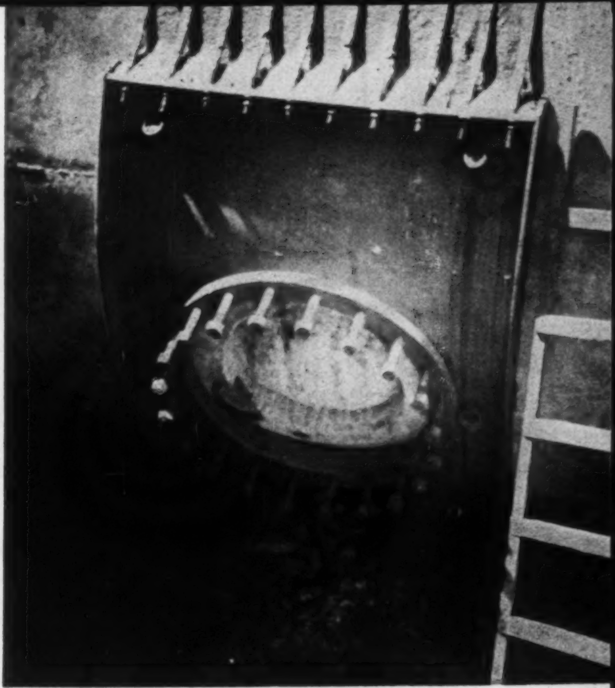
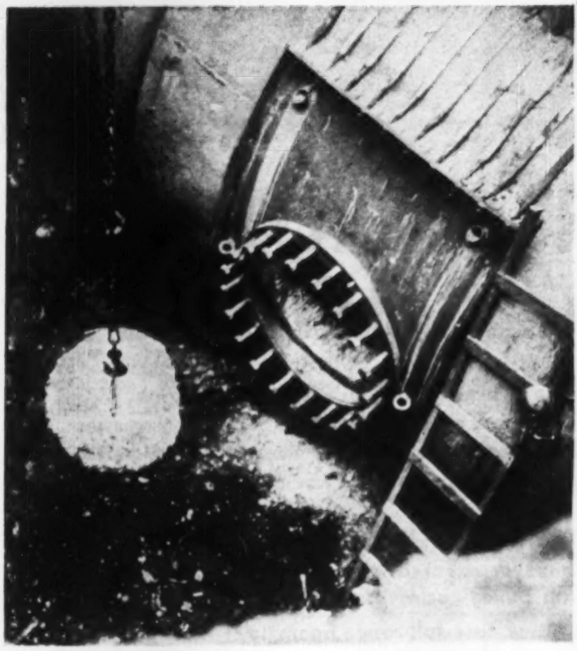


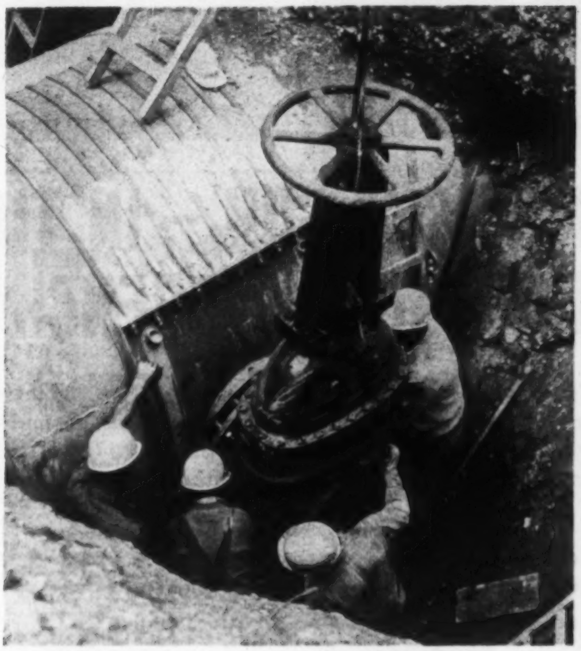
Under pressure, blind-hole drilling starts tap.



Chipping out leaves only 3-in. to go.



Final drill-out comes after pipe dewatering.



Once gate is set, main goes back in-service.

Dayton Taps Main Line in the Dry

How do you quickly and economically make a 24-in. tap on an 84-in., heavily reinforced pipe with 8-in.-thick concrete walls?

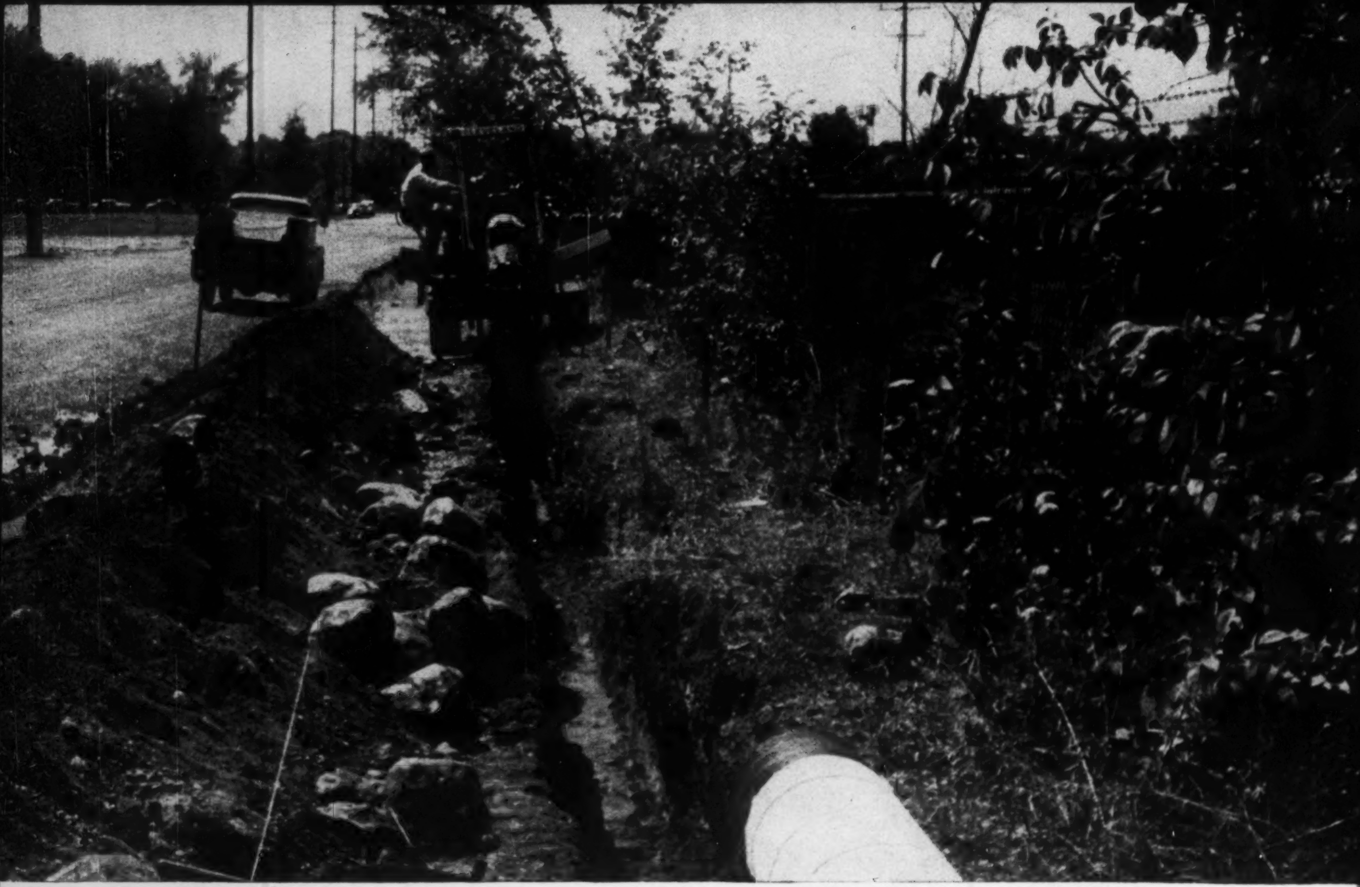
The City of Dayton, Ohio, tangled with this problem when it decided to bypass some of the raw water from its well field around the filtering system.

The plan, aimed at saving $30,000 in annual treatment costs, was to tap a 24-in.-dia bypass line into the 84.-in.-dia raw water transmission line that delivers most of the city's water.

The big pipe is 35 years old and is built about like a Maginot Line bunker. The outer reinforcing cage is made of ⅜-in. x 1-in. rectangular bars 6 in. c-c. Longitudinal reinforcing bars are the same size. The inside cage consists of No. 2 bars, 4 in. c-c, and No. 8 bars 6-in. c-c. The outer cage is covered with 1 to 1¼-in. of concrete, the inner cage has 2 to 2½-in. of cover.

The Dayton water department decided a 24-in. wet tap would be too expensive and mapped out a method of dry tapping that was both fast and inexpensive. A dry tap meant cutting off the city's main supply of raw water,

(Please turn the page)



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- **4 digging-wheel speeds, over 30 positive crawler digging speeds—the *right* combination of power and speed for every soil and condition.**
- **Ample power—big 330-plus-cubic-inch engine**
- ***The world's finest trencher crawlers*—1,000-hour lubricated, 100% anti-friction-bearing-mounted track with dual drive and support.**
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- **V-conveyor with automatic side-to-side shifting—no slow-down to sneak by side obstructions.**
- **Conveyor reversal and speeds up to 1,000 FPM with pulley-enclosed, dual hydraulic drive.**
- **Positive, fast, full-range boom hoist—keeps accurate grade, speeds set-in time around underground obstructions.**
- **Full job-visibility for the operator.**
- **100% control of every operation at the operator's seat.**

There's a Cleveland J for every type and size of trench, from 13 to 30 inches wide, down to 7 feet deep. Check them now with your distributor.

CLEVELAND TRENCHER®

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO so the period of lowest demand—between midnight Saturday and noon Sunday—was picked as the best time to tap the big pipe.

To hold shutdown time to a minimum, engineers planned the dry tapping operation to run much like a pressure tap. Every preliminary phase of the work possible was done under pressure including a 5-in. deep cut in the pipe wall. Pressure in the main was very low, about 6.5 psi.

First step was to drill a ring of ¾-in. holes, 1⅛-in. c-c with an electric impact masonry drill. Water department engineers say the drill contributed most to the speed and ease of operation. It runs on 110-volts, is light enough for one man operation, and is fast cutting both as a drill and a chisel.

Holes were bored 5 in. into the pipe wall and the concrete between them chipped out with a chisel on the same drill to form a neat ring around the circumference of the tap. Reinforcing bars were burned through and the pipe was ready for installation of the tapping saddle.

At this stage there was a minor mishap. While chipping out the annular cavity a small section of peripheral concrete broke away right in the area where the tapping gland gasket would seat against the pipe wall.

To preclude any leakage at this point, workers packed epoxy grout in the chipped out area using a makeshift form of heavy cardboard wired tightly against the pipe.

Next, they strapped the tapping saddle to the pipe and grouted it in place. All that could be done under pressure was complete then and the big line was dewatered starting on a Saturday at midnight.

By 6:00 am the crew had the line dewatered and ready to have the plug knocked out. The electric impact drill punched the ¾-in. holes through the last 3 in. of pipe wall and chipped away the remaining spokes of concrete that held the plug in place. A torch cut one of the reinforcing bars and the breakthrough was completed in just over an hour.

The tapping gland and gate valve were installed and at 9:30 am Sunday the 84-in. main was back in service.

The final tapping operation took three hours and 15 minutes and two hours of that was for setting the gland and the valve.

Water department officials say they saved considerable expense by making a dry tap and since the job was done quickly there was almost no interference with normal operation of the system.

William T. Eiffert is the director of the Dayton Department of Water. Walton Farr is Chief engineer.

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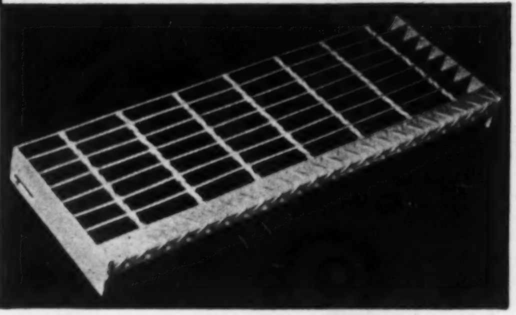

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Increase plant safety with these easily installed treads.
Send now for new, easy-to-use steel grating and tread catalogs.

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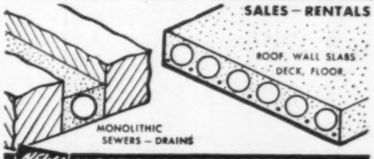

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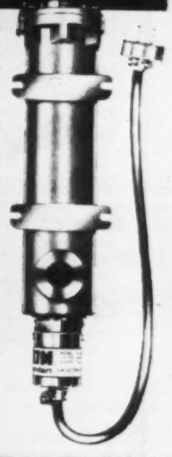

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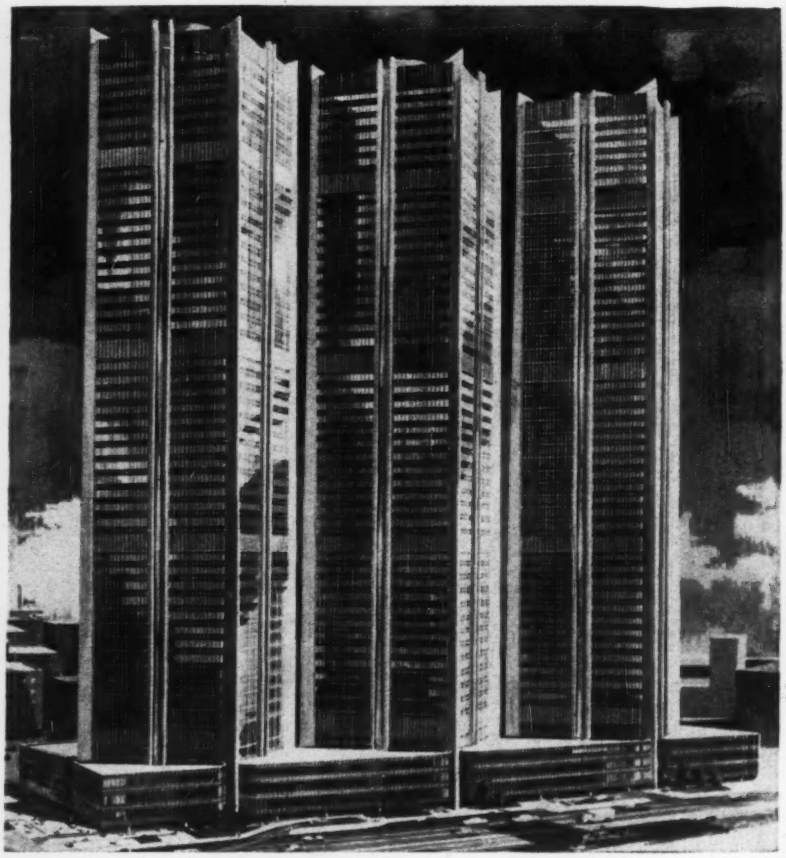


Montreal Begins Its 'Wall St.'

Demolition preceding construction of a $90-million office complex—the world's largest—has started in the heart of Montreal's financial district. Sometime in 1964, the first of three 51-story skyscrapers should open.

Designed by the Italian architect-engineer team of Pier Luigi Nervi and Luigi Moretta, the reinforced concrete towers will enclose a total of 3 million sq ft of floor area in column-free interiors. Two-way ribbed slabs will span 45 ft between a central concrete core and exterior columns. Shear walls resisting wood and seismic loads, will extend from the core to the exterior columns. Corner columns will project as diagonal fins from the building corners.

The center will have parking space for 1,500 cars in six underground levels. The core section of each tower will house 22 elevators.

Planned as future home of the Montreal and Canadian Stock Exchanges, the project should unify Montreal's financial and civic administration district. Canadian and European capital is financing construction.

Associate architects are Jacques Morin and the firm of Greenspoon, Freedlander & Dunne, both of Montreal.

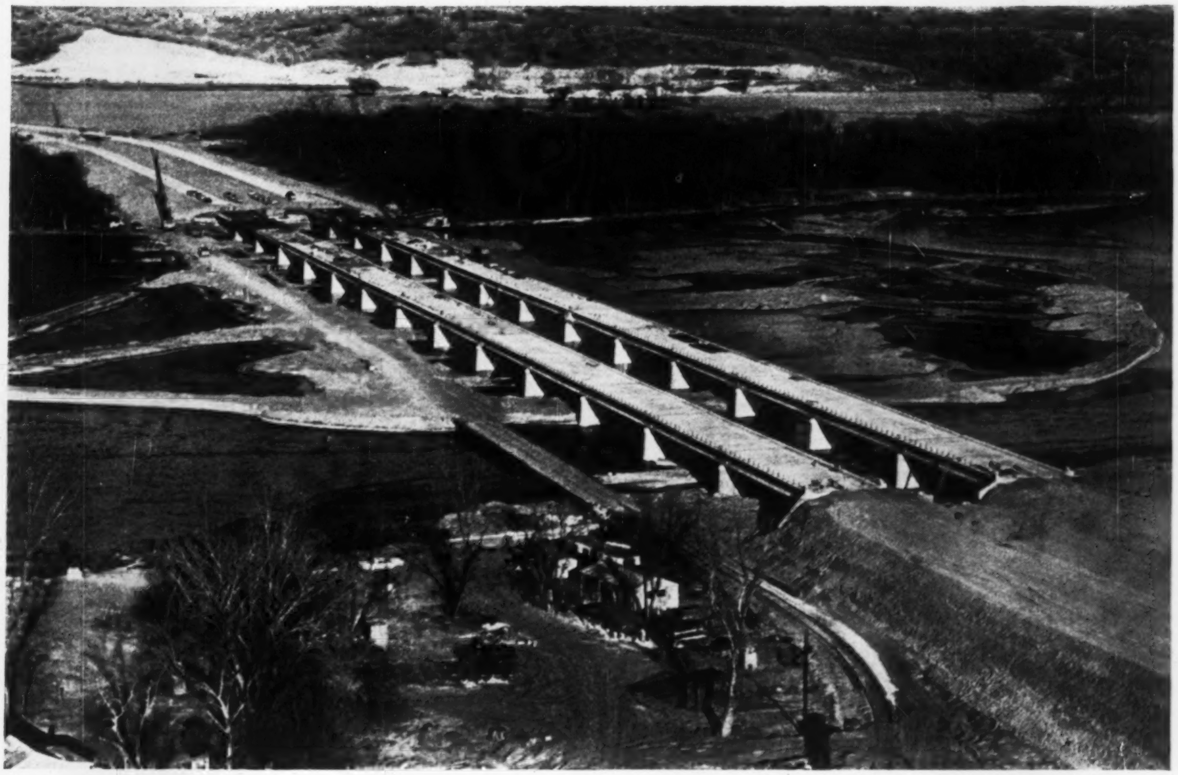
Paul Weidlinger and Mario Salvadori of New York City and D'Allemagne & Barbecki of Montreal are consulting structural engineers. J. B. Carswell of Toronto is civil engineer; and Guy B. Panero, Inc. of New York City is mechanical-electrical engineer.

New Ontario Hydro Plant Is Controlled Remotely

Latest addition to the Ontario Hydro-Electric Commission's power net is the recently opened Red Rock Falls Station on the Mississagi River.

The 40,000-kw plant can be remotely controlled from the Rayner generating station farther upstream where the operator can activate the generators, bring them up to speed and put them on line by sending frequency impulses over connecting transmission lines.

The 95-ft-high gravity dam has a ski-jump spillway—the first Ontario Hydro has installed.



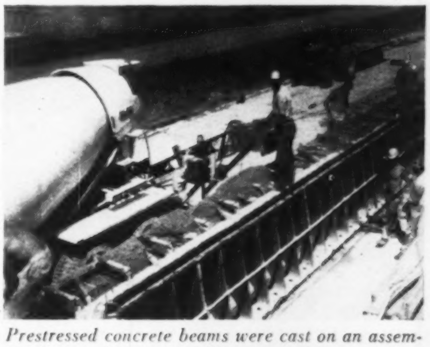
The twin trestle-type bridge is 1,542 ft in length. Each bridge carries a 30-ft-wide, two-lane highway, and has 14 spans of 110 ft. Each span has six prestressed beams—a total of 168.

CHOICE OF PRESTRESSED CONCRETE SAVES $100,000

The twin trestle-type bridges shown under construction here are part of an Interstate project carrying Route 80 across the Platte River between Lincoln and Omaha, Nebraska.

Prestressed concrete construction, selected after competitive bidding, resulted in a $100,000 saving on this 1½ million dollar project. There will be additional savings year after year because the new bridges will need a minimum of maintenance.

31,000 ft of 14-in. octagonal prestressed concrete piling were used in the pier foundations. The 168 prestressed beams required, each 110 ft long and weighing 56 tons, were both pre-tensioned and post-tensioned.



Prestressed concrete beams were cast on an assembly line basis in collapsible metal forms in a bed 350 ft long, 38 ft wide, with movable steel abutments at each end. Here ready-mix concrete is being placed in forms by conveyor.

Prime Contractor: Massman Construction Company, Kansas City, Mo. Design: Nebraska Department of Roads, Lincoln, Neb. Prestressed Beams produced by Nebraska Prestressed Concrete Co., Lincoln, Neb.

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Beams were shipped 35 miles to bridge site by rail and installed on the piers by an ingenious contractor-built gantry.

Contractor's experience with Gulf on $4 million highway job . . .

When John L. Burns, Inc., Nashville, Tenn., was awarded the contract on an 8.6 mile stretch of Interstate 75 north of Dalton, Ga., one of the first steps was to contact Gulf in that area. From experience, the Burns people know Gulf quality products and service play a big part in keeping jobs on schedule.

The Interstate 75 contract calls for Burns to do the complete job—from the first scraper full of excavation to the final foot of asphalt. It requires moving some 4 million yards of shale, rock and dirt. It has to be completed in 450 days.

Stacy Whitt, Superintendent for Burns, is confident the project will be completed on schedule, and profitably. "We've got good maintenance procedures and reliable lubricants and fuels," he commented. "And, if we need something to keep us on our toes, we know that an hour's downtime on just one machine costs us about $90."

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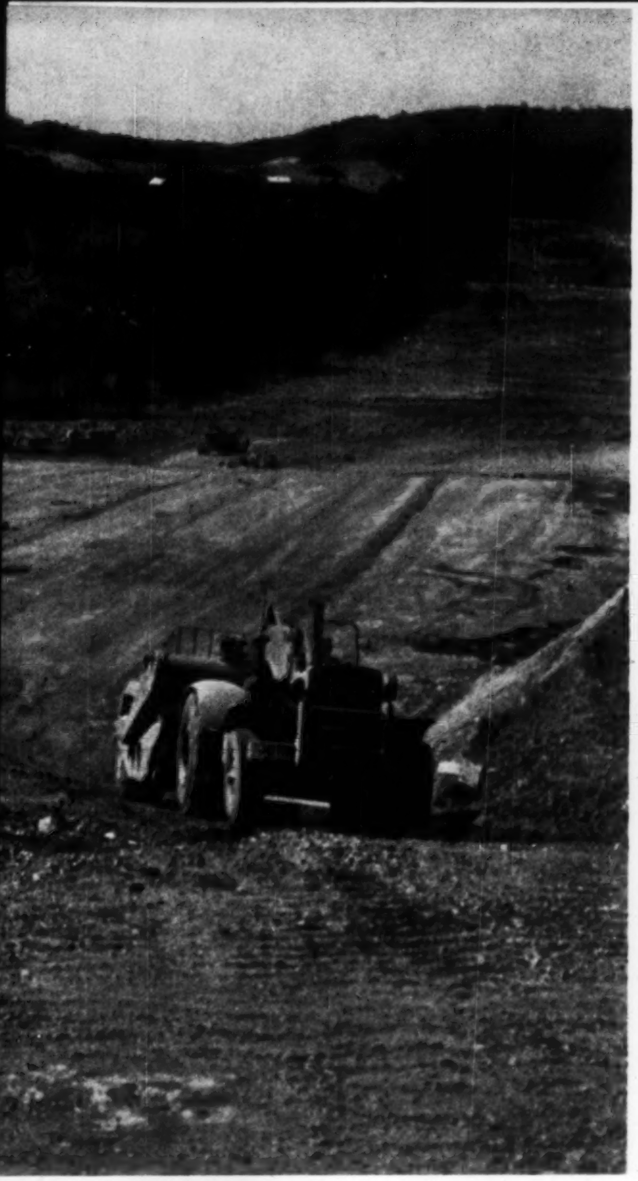

This well equipped truck delivers fuel and lubes to equipment on the job.

Left to right — C. R. Reese, Jr., Gulf Representative, Stacy Whitt, Project Superintendent and J. L. Bond, Gulf Distributor, discuss petroleum requirements. Job site engineering counsel is always available from Gulf.

Early stages of the job require the removal of 500,000 yards of dirt and shale from this 75 ft. deep cut.

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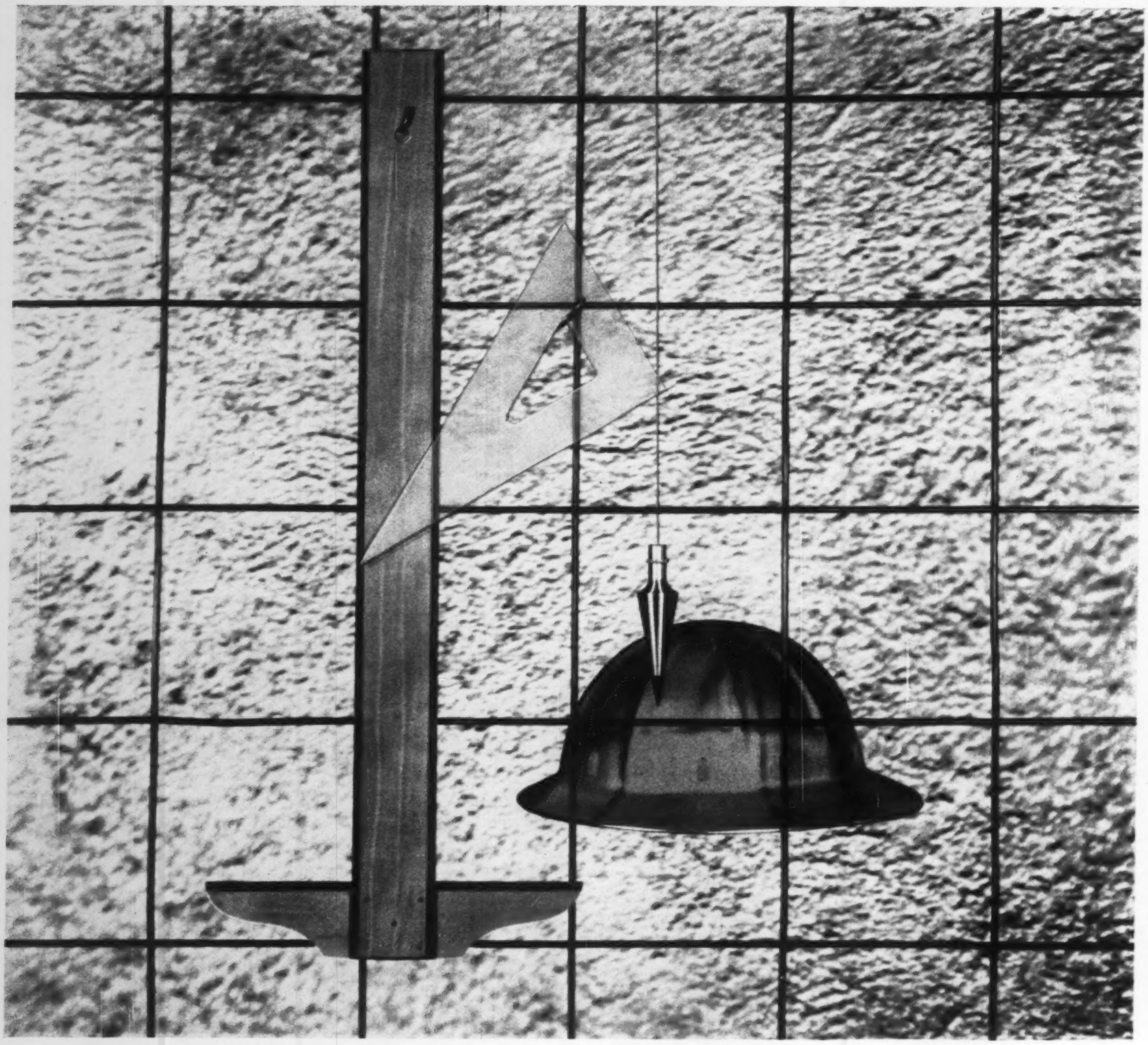

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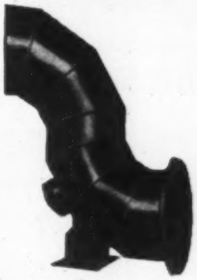

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Men and Jobs

College Head Becomes ASCE President

ASCE's new president, G. Brooks Earnest, long known for his active and enthusiastic leadership in the conditions of practice activities of the Society, will switch emphasis during his year in office to put special effort on upgrading the technical aspects of ASCE.

Brooks Earnest feels an urgent need for this change in his attentions: Technological advances create new technical challenges civil engineers must face.

"Civil engineers are not progressive enough about new ways and means of doing things in design and construction," he says, "Computers, EDP, solid state physics, electronics and space have created a new world for electrical engineers. Mechanical engineers also have adjusted to change."

Where does this leave civil engineers? he asks.

His answer: They have no choice but to find new and better materials for construction, for the health and safety of man.

"We're not striving hard enough. We're too often content to think 'This works well, so why change? The old way is just as good.' But there is still much to be done with the materials of construction. We've had some breakthroughs in materials. There are some things being researched that are proving themselves. But we can't leave this development job to others.

"There are many strides to be made in transportation. The growing complexity of urban development is bringing new problems in city planning. Also, we've reached the point in this country where many water supply problems are important study areas," he says.

The personable, 59-year-old president of Cleveland's Fenn College believes there are better and faster ways of doing things, feels economics is putting the pressure on civil engineers to produce them.

"We must find cheaper, quicker methods of construction," he says. "Profits are getting harder to come by, and we must face the economic facts of life."

Educator Earnest feels the pressure on civil engineers to produce improved methods has been intensified by what he calls "academic helps."

"We are picking up all kinds of academic helps in design features," he says. "Photogrammetry helped; computers helped; new electronic devices for measuring distances helped. These are all steps taken to improve some features of civil engineering, to ease up the man-hours required on a job. But there is still much to be done, so much these academic helps have freed us for."

Most of Brooks Earnest's ASCE work has been on the professional, not the technical side of the Society, although he has had some technical background of committee activity. When he served on the Board of Direction, he was mainly interested in and assigned to committee activities that had to do with the professional side, he admits candidly. He was chairman of the Committee on Employment Conditions in 1953-54 and presided at the first Conditions of Practice session at the 1954 Atlanta national meeting.

A likeable man who admits to being too public-relations-conscious to fight for fighting's sake, Brooks Earnest has no argument with what ASCE has been doing. He has no intention of making revolutionary changes. In fact, he holds a strong opinion on the continuity of ASCE leadership:

"You pick up where the last president left off mainly," he says. "But each president has some goal he wants to work toward, which may or may not be reached during his year in office."

His goal as president of stressing technical work in the Society will be implemented by the improved format of the Society's technical meetings, Mr. Earnest says. He supported the new proposal to have the 14 technical divisions of the Society meet in allied groups to provide better professional and technical meetings (see p. 21)

Meetings under the new plan, Brooks Earnest says, will be more serviceable. They will bring more members to attend, will cut down simultaneous sessions of similar interests, and will improve the quality of meetings.

"I'm wholeheartedly in approval of this package type of format," he says. "This is a way of interesting more civils in ASCE activities. It will provide better technical papers; we'll increase the standards of our papers by drawing together at one meeting only those who are interested and active in that group.

"...Each president of this Society has some goal he wants to work toward

"Civil engineers are not progressive enough . . .

We're not striving hard enough . . .

We must find cheaper,

G. Brooks Earnest says he has 12,000 bosses at Fenn College; now he's got 47,000 in ASCE.

It will challenge members to do a better job of thinking and writing," he continues.

The ASCE faces not only new technical challenges, but it will face increasing challenges in the conditions of practice area this year, Brooks Earnest believes.

Agitation for changes in engineering education, improving academic excellence, the recent highway and other construction scandals, and continuing pressure to improve standards of employment—all will come in for their share of Society attention, he says.

President Earnest, who has spent 31 years in engineering education, believes the Society will make a decision on this subject this year.

"The impetus is there," he says, "and there is something to resolve. I'm hoping we can resolve it this year." The education question facing ASCE—a move to make the first CE degree a graduate degree after five years—is of real concern to him as engineer-educator.

With a B.S. and M.S. (plus an honorary doctor of engineering) from Case Institute of Technology, he first taught engineering at Case in 1930, rose from instructor to full professor by 1948, went to Fenn College as dean of engineering in 1951 and became Fenn's president the following year.

He admits engineering education is a controversial subject, but he's not the type to avoid an important controversial issue.

"In my business, you're on the hot seat all the time," he says with a smile. "Counting the Fenn board of trustees, the faculty, staff and students, I've got 12,000 bosses now."

The differences between proponents of "systems" education versus more specific engineering education must be resolved, he believes.

Systems, or interdisciplinary education, described by Brooks Earnest as study of the general relationships in engineering and science, has won the support of many engineers and engineering schools. But he does not feel this is the answer to the increasing technological demands being made on all engineers and therefore on engineering schools.

"I don't believe all colleges and universities should go all the way to the systems method of engineering educa-

during his term of office"

quicker methods . . .

We are picking up all kinds of academic helps . . .

There is still much to be done."

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tion," he says. "I don't like the road we're being led down by the systems people. I go along with it to a degree, but I'd like to stress quality, and stress graduate degrees. Interdisciplinary education is best suited for those who will be engaged in research or education. Systems teaching creates a trend toward making the employer give specific job training.

"For something like Project Mercury, say, we'll need a civil engineer expert in stress analysis to design foundations, the superstructure, and indeed the missile itself. We'll need the electrical engineer for the communications and other electronic devices; the mechanical engineer for the kinetics involved; the metallurgist for re-entry problems; the chemical engineer for the propellants. All types of engineers are needed all the way along the line. The systems people would say we need a man well-versed in all these fields, and this is unrealistic."

Although he has strong opinions on the subject of engineering education, Brooks Earnest denies he will have any influence on the ASCE's decisions or recommendations in this field.

"I'm an educator," he says, "but this is a democratic society and my opinion is just one man's. My opinion will be discussed—and cussed—as anyone else's."

"I don't feel the package-type-educated person is an engineer," he says. "He's not an engineer until he actually applies his theory. And if he doesn't get a chance to apply theory, he's a scientist and not an engineer. After an education of that sort, it would still require several years in practice, applying his theory, to qualify him as an engineer. He'd be better equipped, in my opinion, if he could see the application of the theory along with the study of the theory," he says.

A firm believer in applying theory to actual problems, G. Brooks Earnest has worked for the Pennsylvania highway department, the Cleveland Union Terminal, Cleveland Rapid Transit and the New York Central Railroad as engineer and designer. He was a member of the committee instrumental in creating a department of city planning in Cleveland and has worked on transportation problems for the city.

Mr. Earnest sees ASCE's student chapters as a place for teaching good principles of engineering.

Thoroughly familiar with student chapter activities as a former member and chairman of the ASCE national Committee on Student Chapters, he thinks inspection trips are a fine way to implement classroom theory with on-the-job experience. And he stresses that the student chapter provides a good forum for driving home other lessons important to civil engineers, lessons in integrity.

"It's a matter of education," he says. "Perhaps at the student chapter or associate forum level, and in the local sections as well, we can further intensify the habit of being honest, stressing the responsibility of the individual. That's what we must do—stress the characteristic of integrity, doing everything possible to impress students studying civil engineering," he insists.

The ASCE, in its newly amended Code of Ethics, has done a fine job of offering a comprehensive description of the principles the Society and its members stand for, he feels. But there's more to be done. ASCE even now is studying in committee the recent highway scandals, he says.

"I believe that those who've accepted bribes are not professional engineers, but are on the sub-professional or technician level," he says. "For example, not one of the Florida people accused of accepting bribes was an ASCE member."

Brooks Earnest believes firmly in penalties for non-professional conduct, but he points out that the ASCE does not control a member's professional license. He puts that responsibility with the state boards, but says ASCE could call malpractice to the attention of a state board to begin steps to withdraw the license of any guilty engineer. A strict set of penalties for specific acts should be set up, he says.

"The procedures of ASCE in ethics cases will not be changed," Mr. Earnest says. "The board now does a thorough and detailed investigation of charges brought before it, and dismissal from the Society is serious enough."

Although the technical side is what G. Brooks Earnest says he will concentrate on this year, his recent comments on standards of employment have drawn considerable interest. In a speech at ASCE's convention in Phoenix last spring he proposed that employers of engineers be rated according to set standards of employment conditions. His suggestion is not being let drop. Meeting with the Society's Employment Conditions Committee in December, President Earnest will discuss definite ways and means of making such standards practical.

Brooks Earnest has been a member of the ASCE's Cleveland Section since 1935, was its secretary-treasurer, vice-president and president. He has been a director of District 9 and vice-president representing Zone III in ASCE. He'll now hold ASCE's top job until October 1962.

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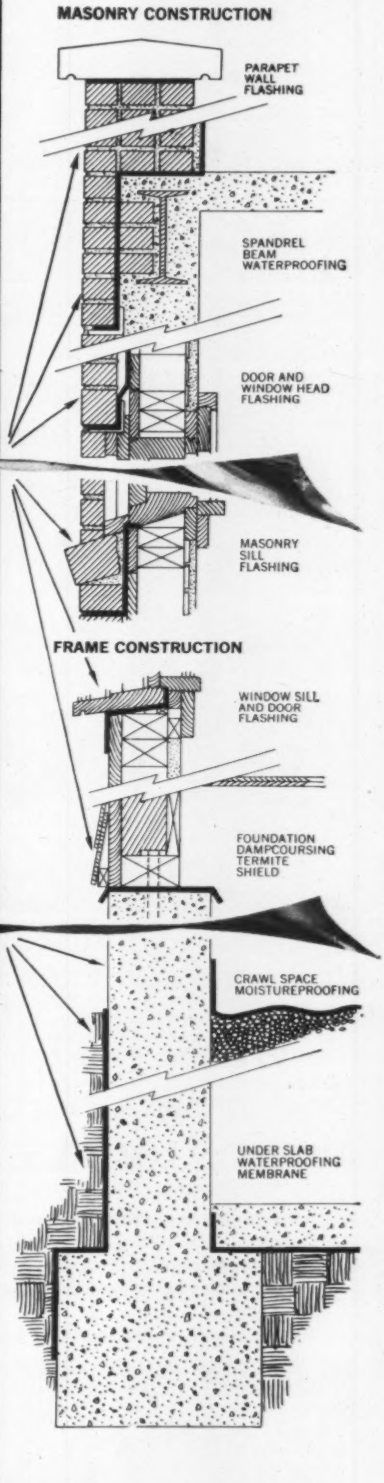
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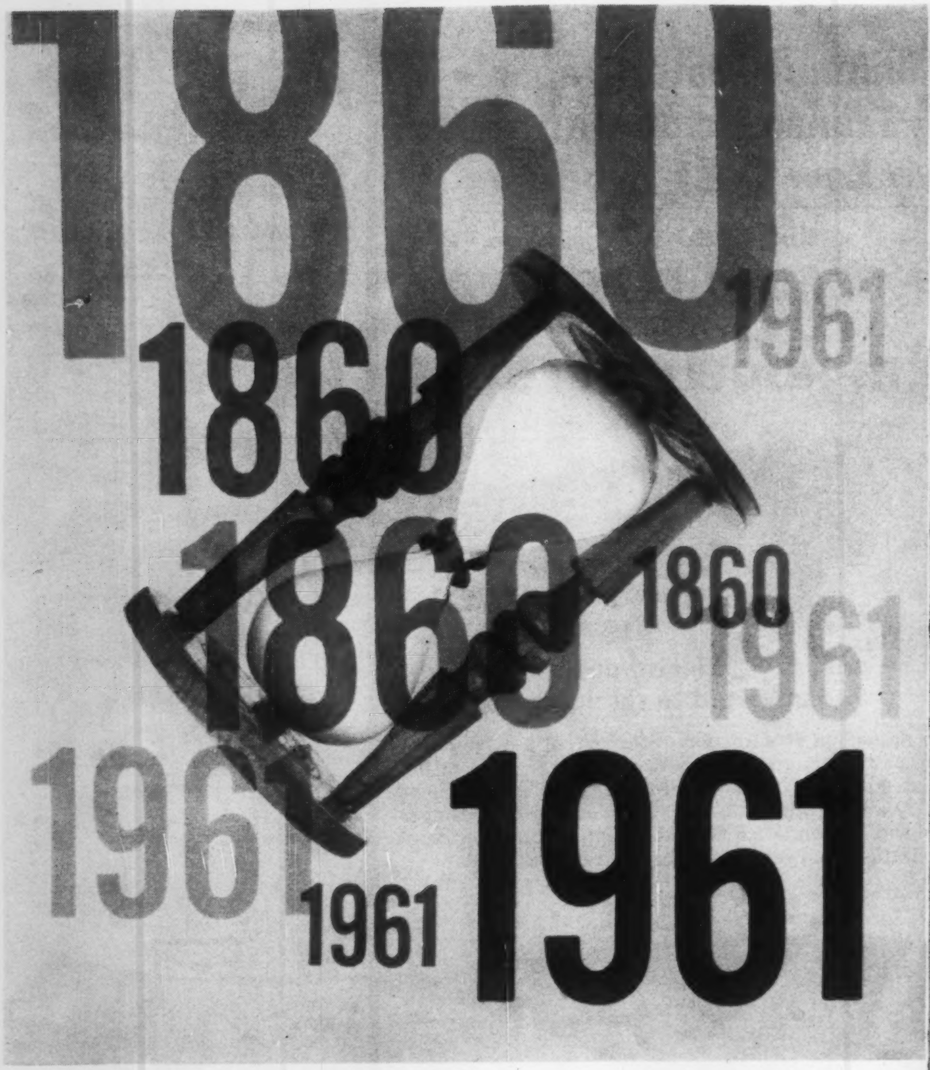

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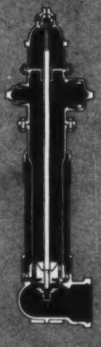

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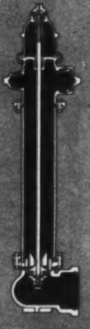

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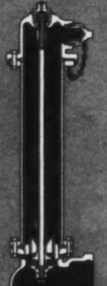
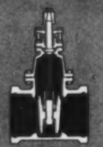


R. D. Wood Swivel Joint Hydrant can be faced in any direction.



R. D. Wood Gate Valve—bury it and forget it.

Unit Prices

Low labor prices swing award for . . . .

Concrete Reservoir in Ohio

A 75 million gal capacity reservoir for the Cincinnati Department of Water Works will be built by the Penker Construction Co., Cincinnati, at a cost of $4,288,088. The reinforced concrete, box structure with roof will be constructed within the confines of an existing open water storage basin. Black & Veatch, Kansas City, Mo., are the engineers.

Labor and materials were bid separately for each item, with labor picking up 44% of Penker's low and 48% of Foley Construction Co.'s second low. Wages varied much more than total cost. Penker's labor bid of $1,882,351 is 23% below Foley's labor bid, but the low contract price is only 8.9% short of Foley's bid and 19% below the high of four bids.

The reservoir, for potable water storage, is designed in two compartments by division wall. It has an irregular rectangular shape, and a surface area of approximately 7 acres. The reservoir contract also includes a pumping station for housing transfer and service pumping equipment.

The Department of Water Works will supply the contractor with minor valves and steel pipe. Materials will be transported to the site by highway, and the distance from the railhead is only half a mile.

Cincinnati wage rates include: common labor, $2.90/hr; carpenters, $3.95; plumbers, $4.115; and reinforcing ironworkers, $4.00/hr.

The bidding included:

1C	Penker Const. Co., Cincinnati, Ohio	$4,288,088
2	Foley Const. Co., Cincinnati, Ohio	4,707,705
4	Maxon Const. Co., Inc., Dayton, Ohio	5,286,427

Bids: 8-23-61 Items	Unit	Quantity	Unit Prices 1C	2
Test Holes				
Moving in & out	ls	job		
M			$10.00	$5,000
L			90.00	5,000
Coring	lf	450		
M			3.95	5.00
L			6.00	5.00
Borings	lf	1,070		
M			2.80	4.50
L			6.00	4.50
Excavation and Associated Items				
Excavation	cy	82,700		
M			1.00	1.00
L			6.00	3.00
& backfill	cy	130		
M			3.00	5.00
L			30.00	20.00
Topsoil & borrow	cy	4,250		
M			1.00	1.50
L			0.50	1.00
Sodding	sy	8,340		
M			0.30	0.30
L			0.10	0.30
Backfill, granular	cy	360		
M			2.00	1.50
L			1.00	1.00

Bids: 8-23-61 Items	Unit	Quantity	Unit Prices 1C	2
Reservoir Side Walls				
Concrete	cy	4,000		
M			13.00	20.00
L			22.00	15.00
Forms	sf	69,000		
M			0.50	0.50
L			0.50	0.50
Steel, reinf.	lb	930,000		
M			0.10	0.07
L			0.05	0.05
New Gravity Wall at Existing Stone Division Wall				
Concrete, incl forms	cy	4,680		
M			16.00	15.00
L			3.70	15.00
Steel, reinf.	lb	135,000		
M			0.10	0.07
L			0.05	0.05
Sandblasting	sf	6,600		
M			0.10	0.10
L			0.10	0.15
Shear keys	sf	800		
M			7.00	1.00
L			6.00	4.00
Division Wall				
Concrete	cy	2,250		
M			20.00	20.00
L			15.00	17.30
Forms	sf	1,500		
M			0.50	0.50
L			0.50	0.50
Steel, reinf.	lb	400,000		
M			0.10	0.07
L			0.05	0.05
Reservoir Floor Slab Concrete				
Concrete, for sloping slab	sy	17,250		
M			5.00	4.00
L			3.00	4.00
for bottom slab	sy	23,000		
M			4.00	4.00
L			2.75	3.50
Supporting Facilities for 48 in. Reinforced Concrete EHS Pump Discharge Pipe Lines				
Concrete	cy	170		
M			16.00	15.00
L			8.00	10.00
Forms	sf	8,300		
M			0.50	0.50
L			0.50	0.50
Steel, reinf.	lb	13,300		
M			0.10	0:07
L			0.05	0.08
Grout Fill for Existing Drainage Facilities				
Moving in & out	ls	job		
M			500.00	2,500
L			1,000	2,500
Grout work	cy	400		
M			25.00	25.00
L			11.00	20.00
Concrete col for reservoir	lf	5,050		
M			4.00	10.0
L			4.00	2.00
Concrete piers	cy	2,630		
M			57.50	28.00
L			40.00	40.00
Jts, rubber water stop, 3-bulb tp.	lf	14,500		
M			3.50	5.50
L			3.00	1.00
Concrete pavement	sy	1,340		
M			5.00	5.50
L			2.00	2.00
All items of work	ls	job		
M			1,400,000	1,341,616
L			828,441	1,500,000
Mirrow Lake	ls	job		
M			64,776	100,000
L			50,000	83,320

ENR Constr. Cost Index (1913=100) 20- cities avg.-854.09

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led the way to...

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CLAY
PIPE

■ Today's all-new Clay Pipe is the fastest-laying, longest-lasting, most leak-resistant Clay Pipe ever known. Robinson research helped create it, and Robinson's 15 strategic branches get it to you on time.

NEW LENGTH—Cuts installation time and costs, keeps jobs on schedule.

NEW STRENGTH—Extra density takes heavier loads, traffic vibration.

NEW JOINTS — factory-made Wedge-Lock®, Wedge-Lock® Type "O," Slip-Joint.

NEW GUARANTEE*—Now a full 100 years!

**Write for your copy of the 100-year Clay Pipe guarantee certificate.*

Wedge-Lock and Wedge-Lock Type "O" conform to ASTM Designation C425, Type I and Type III.

THE
ROBINSON
CLAY PRODUCT CO.
ESTABLISHED 1856
AKRON 9, OHIO

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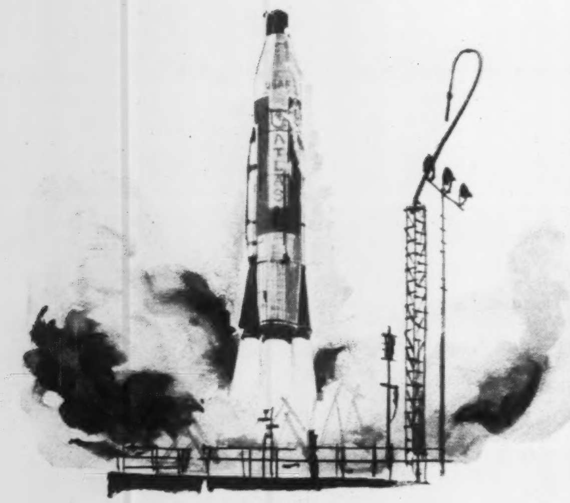
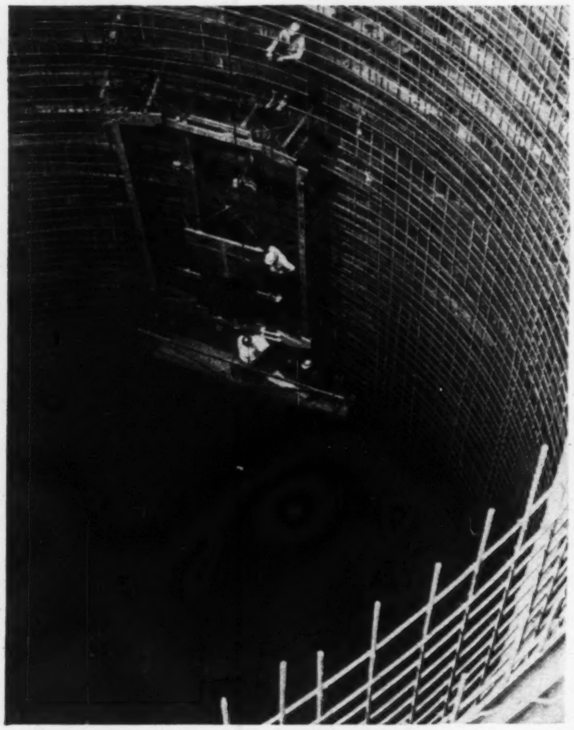




Sheffield Armors Atlas Missile Bases
–with reinforcing steel

Reinforcing steel for Mid-America's Atlas Missile Complex in the Lincoln, Nebraska area, comes from Sheffield.

The Lincoln ICBM project is the nation's first underground Atlas installation. It includes 12 missile sites covering an area larger than the state of Connecticut. Each installation consists of an underground silo of reinforced concrete, 175 feet deep, to house the missile and a control center for servicing and launching it. Sheffield is also furnishing the steel for the Atlas Missile Base at Altus, Oklahoma.

12,000 tons of Sheffield steel are being used at Lincoln, most of it No. 18 reinforcing bars. These re-bars, which give the concrete missile housings Gibraltar strength, weigh 13 lbs. to the foot. They make the strongest possible bond between the concrete and steel.

Your next project may not be as earth-shakingly important as a missile base . . . but take a tip from Uncle Sam. If your job calls for re-bars, call on Sheffield. No job is too large or too small. The strategic location of Sheffield plants and warehouses assures quick delivery. **Sheffield Plants: Houston, Kansas City, Tulsa.**

SHEFFIELD

Crescent Reinforcing Bars

Actual Size Section No. 18 Sheffield Re-Bar

Strong
Tough
Economical
Efficient
Lasting

Steel

ARMCO Sheffield Division

Materials Prices Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Oct. 19; Next, Nov. 23.
- Iron & Steel Products, Pipe: Last, Oct. 12; Next, Nov. 16.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, Oct. 5; Next, Nov. 9.
- Building Board Insulation, Wage Rates; Mexico City Materials and Wage Rates.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver mm	Detroit mm	Kansas City mm	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh pp	St. Louis	San Francisco mm	Seattle	Montreal	Toronto
STRUCTURAL CLAY TILE																							
partition-scored																							
3x12x12 in.	M	$154.95pe	$217.00	$135.00pss	$232.00†	$137.00ll	$179.00mmjvv	$205.00ll	$162.00	$170.0	$257.00	$158.00	-	$218.00pe	$178.00	$236.00wwh	$263.00ss	$200.00t	$180.00mmpp	$156.85*	$235.00pt	$168.78uqoo	$169.00rr
4x12x12 in.	"	154.95pkke	231.00	152.00pss	248.00†mm	149.00ll	190.00mmjvv	219.00ff	162.00	185.00	274.00	158.00	r	225.00pe	178.00	236.00wwh	281.00ss	213.00t	199.00pp	177.10*	270.00pt	180.93auqoo	185.50rr
8x12x12 in.	"	309.90pe	434.00	....	463.25†mm	280.00ll	355.00jddmm	410.00	318.75	310.00	514.00	312.00	r	452.00pe	371.25	378.00wwch	527.00ssxx	400.00t	380.00pp	235.30dd	490.00pt	325.00ausqoo	360.00rr
Load Bearing—Scored																							
8x12x12 in.	"	387.40pe	491.00	303.00p	556.00†mm	....	390.00jmmvv	465.00ff	387.75	310.00	582.00	312.00	r	225.00pwe	371.25	360.00wwhn	597.00ss	453.00t	410.00pp	159.40qq	265.00pwt	220.00qoo	281.50rr
10x12x12 in.	"	....	602.00	376.00p	....	....	422.00jmmvv	....	472.50	390.00	767.00	400.00	r	....	....	....	....	607.00t	440.00pp	....	....	400.00qoo	405.00rr
12x12x12 in.	"	....	690.00	465.00p	....	....	500.00jmmvv	709.00f	385.00	442.00	876.00	500.00	-	....	....	....	....	693.00t	621.50pp			....	506.00
BRICK, common backing	"	33.25uu	36.00	27.00ii	43.50p	32.00	50.00jk	44.00tt	32.00	35.00xz	53.50pmm	34.00	$42.00uu	49.50vpe	42.00	46.00p	40.00mm	42.00t	44.00mmpp	43.00*	57.00t	48.25b	25.00rr
Straight hard	"	33.25uu	41.00	38.00jj	58.00p	34.00	49.00jk	48.00ggtt	53.00	54.00	54.00pmm	34.00	44.00	58.00vpe	55.00	....	45.00mm	40.00t	45.50pp	43.00*	71.00t	56.30b	60.00rr
LIME, in paper, Hyd. fin.	ton	42.50hh	35.80	38.28mm	42.00§	1.00aaii	29.20jmm	32.75ptt	38.36	48.00p	38.00mm	36.26	38.00nn	47.20bbe	48.00p	40.00p	40.00mmp	30.00t	1.00aapp	29.24	52.00bbt	39.00	34.00mm
" " " Com hyd.	"	35.50hh	23.40	20.87mm	34.00§	0.90alaa	29.20jmm	28.00ptt	23.32	44.00p	30.00mm	34.26	38.00nn	40.00bbe	32.00p	38.00p	24.50	26.00t	0.80aapp	29.24	38.00bbt	22.00	36.40mm
" " " pulverized	"		....	26.33gmm	....	....	29.20jmm	....	26.00	46.00p	40.00mm	29.76	39.00nnll	48.00bbde	....	....	27.50	34.00t	1.35zaapp	31.74	1.30mbbt	13.25	34.75mm

•§ F.o.b. yard. •* F.o.b. plant Stockton. •† F.o.b. yard Roxbury. •a Smooth. •b $4.50 del. •c 8 x 12 x 12 in.-6 cell. •d Pulverized hot. •e less 5% disc., 10th. •f 8 x 8 x 12. •g Lumps, $26.72. •h F.o.b. trucks, job site N.Y.C. •i 60 lb sacks. •j Truck load or over. •k $1.00 discount per M, 10 days. •m Per bb. 180 lb. processed. •n 7¾ x 7¾ x 12. •o Mason's double hydrated pressure. •p Truck lots. •q Provincial and Municipal tax extra (6%). •r Not used: earthquake danger. •s 8 x 16 x 12. •t less 2% disc., cash. •u Incl. Federal tax. •v Sand lime. •w 5 x 8 x 12. •x dumped. •y Chi common. •z Pebble; 80 lb sack. •aa 50 lb sack. •bb LCL. •dd 6 x 12 x 12. •ff 80% common. •gg Smooth. •hh less 25¢ disc., cash. •ii F.o.b. plant. •jj rough •kk 3½ x 11½ x 11½. •ll less 2% disc. 10th. •mm less 2%, 10 days. •nn F.o.b., L. A. •oo less 2%, 30 days. •pp add 2% sales tax. •qq 8 x 5½ x 11½. •rr 2½% disc., 10 days. •ss 5% disc., 10 days. •tt less 2% disc., 15th. •uu less 50¢/M, 10 days. •vv 4000 pcs. and over. •ww Now manufactured in perodic instead of tunnel kiln.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis K	San Francisco	Seattle	Montreal	Toronto
LEAD, red, dry	CWT	$15.10ggJO	$17.50pp	$26.00†J	$24.95†oomm	$15.25rjqqpp	$15.25†JO	$25.65†	$22.50	$23.85n	$15.95r	$33.15ggool	$16.25yy	$16.25N	$23.00Jpp	$14.75ocO	$14.75mmO	$21.50mggJ	$25.65†m	$26.70mm	$13.35HO	$19.45O	$14.95
White, in oil	"	24.00ggJ	24.00	29.00†J	26.90†mmm	24.00†J	24.00†J	26.90†	23.50M	24.00	24.00rr	28.65	22.00	21.50kk	24.00J	29.75	19.00mm	24.00J	26.90	26.90mm	24.00H	26.00wtt	21.65
READY-MIXED PAINT																							
Graphite b	gal	....	3.00	3.90J	....	....	....	3.32ggP	......	3.70	....mm	4.04	3.30	....	....	....	3.35mm	2.20#EJ	....	3.20mm	....	5.52Dftt	5.15J
Aluminum	"	4.10	4.40	3.40J	....	....	....	3.63zzgg	3.25B	5.10	....mm	3.48	4.50n	....	....	....	3.90mm	2.25#FJ	....	4.30mm	4.19ccffJ	6.55xff	6.18J
Ferric Oxide	"		3.50	....	....	....	....	4.25qgg	......	......	....mm	3.06	4.20n	....	....	....	3.65mm	2.25#GJ	....	3.50mm	....	5.10kfft	5.95J
ROOFING SUPPLIES	square	3.15kk	3.06	2.95†mm	3.55q	3.45ukk	2.99mm	3.05q	3.00u	2.94	2.85mm	3.21mm	3.40nkk	2.85kk	$2.78	2.60xx	......	2.90sH	2.99iismm	2.87mm	3.34ccH	5.40	2.90
Rolls, slate surf	CWT	2.30kk	3.67	2.17ii†mm	2.60q	2.75okk	2.20mm	2.25o	3.00o	2.25o	2.10omm	2.68omm	2.40njkk	2.10hikk	1.98	1.90xxo	2.65	2.15sH	2.19hh	1.72aaiimm	2.89hccH	4.65†	2.15aac
Asphalt felt	"	2.58	4.04	2.17ii†mm	3.04q	3.15okk	2.65omm	2.75o	3.00o	2.80o	2.55omm	2.68omm	......	2.55bikk	2.85	2.29o	2.55	2.15H	2.64hh	2.59mm	....	4.65†	2.15o
Asphalt coating	gal.	0.72kk	0.50	0.76ffmm	0.55q	48.00bbkk	0.56ymm	0.41y	0.47o	0.50f†	0.56ffmm	0.59y	0.75nykk	0.52ikk	0.68	0.52z	0.74	0.56H	0.50–0.55y	0.46jj	0.66cc	1.60	0.63j
tar pitch	ton	49.00	54.00	48.00eemm	60.00	57.70†kk	57.96Hmm	49.00gg	66.00hh	50.00	49.00mm	....	s.....	50.00rkk	45.50	49.00*	49.00	55.00H	57.60	54.00	....	4.40uu	48.00A

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •* Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Ne: carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb roll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •x Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package. •ff 5-ga drums. •gg F.o.b. Cleveland factory. •hh Incl. freight. •ii Per 324 sf roll. •ii Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more. •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •xx Sept.: Rolls revised to $2.75. Asph. Felt revised to 1.71. •yy Sept. revised to $12.00. •zz Sept. revised to $2.80. •A 400 lb barrels. •B ASTM Spec. D962-49. •C 95%. •D Std. black. •# Milt. spec.: •E TTP27; •F TTY81; •G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •N under 500 lbs, add $1. •O 50 lb. bag .

PLASTER, VERMICULITE AND METAL BUILDING SHEETS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis uu	San Francisco	Seattle	Montreal	Toronto
PLASTER, neat	ton	$33.00ss	$24.00	$37.00ss	$26.00	$1.45bbtt	$24.95*ss	$29.00*ss	$32.80	$29.00	$28.00ss	$30.00	$28.00tt	$34.50F	$34.00	$27.00	$27.25	$30.00nn	$30.00	$29.50ss	$42.40nn	$22.60h	$30.00
gauging	"	45.00ss	35.70	43.00ss	30.00	1.45bbtt	24.95*	45.00N	35.60	29.00	28.00ss	35.00	29.00tt	34.50F	42.00	35.00	33.00ss	31.00nn	43.00	30.50ss	45.60nn	35.60h	50.00
VERMICULITE																							
Home insul. pellets	4 cf bag	1.65sss	0.95	1.55ss	1.40	1.55	1.75*ss	1.39ss	1.05	1.63	1.27ss	1.24E	1.25	1.65tt	1.38P	1.35	1.40ss	1.25nn	1.35	1.38ss	1.55nn	1.25h	1.47bl
plaster agg.	"	1.65sss	....	1.55ss	1.40	1.60	1.75*ss	1.34ss	1.21	1.40	1.31ss	1.26E	1.20ktt	1.80F	1.36P	1.38	1.25ss	1.30nn	1.60	1.38ss	1.35knn	1.40h	1.43bb
concrete agg. treated	"	1.85sss	....	1.60ss	1.40	1.60	1.85*ss	1.45ss	1.37	1.50l	1.40ss	1.34E	1.45	1.95Fl	1.42P	1.50	1.45ss	1.40mm	1.65	1.50ss	1.85lnn	1.60h	1.66bb
PERLITE, plaster agg.	"	1.65ss	1.15	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.21	1.50ss	1.45kii	1.26	1.16	1.40S	1.15P	1.45	1.05ss	1.40nn	1.55	1.38oss	1.50k	1.15v	1.14Q
concrete agg. untreat.	"	1.65ss	1.55	1.27ssl	1.55ss	1.60	1.75ss	1.45ss	1.32	1.60ss	1.50kii	....	1.26	1.50S	1.25P	1.40	1.05qqss	1.40nn	1.60	1.58oss	....	1.15v	....
BUILDING SHEET																							
Alum. flat, .100"	lb	0.469noo	0.469	0.459M	0.474	0.514x	0.469	0.449aa	0.459	0.479	0.469a	0.469	0.449	0.469	0.469	0.479aT	0.479	0.475	0.469	0.575	0.50D	43.95AH	0.4375
corr. roof, .032"	sheet	9.86nY	0.451r	9.66K	25.07AAp	33.10p	9.35	24.51p	0.463	10.89	9.35a	26.74ggyyp	8.77Z	10.09	33.43	25.54aXAA	8.86	10.39	9.56	10.83	11.25D	12.10H	26.00ap
Stainless steel, 20 ga	CWT	61.25nxx	58.19	64.50K	62.66ddxx	56.30ee	56.66xx	58.50ooxx	60.50	65.32gg	58.35axx*	67.50E	60.11	63.61GR	59.19Y	62.33a	58.86	63.00	61.64Kmmgg	65.00K	60.10D	65.75H	73.74
28ga	"	71.25nxx	67.69	73.00K	72.67dd	65.40ee	65.91xx	68.00ooxx	83.50	73.57gg	67.85axx*	76.25E	69.61	69.61ffG	68.69Y	72.33	68.36	74.50pp	71.64ygg	77.25K	69.60D	....	86.52

•‡ trucklots, delivered •† fob warehouse. •* fob city. •a delivered. •b ½" O.D. •c ⅝" O.D. •d per st. •e 34" x 60" sheet. •f per 100 ft. •g 5 tons & up: cold roll, anneal & pickled 2B finish. •h Incl. Federal tax. •i add 25¢ for pint of additive. •j 1100 & 3003 alloy, mill finish. •k bag of 3 cu ft. • treated with air entraining agent. •m 2-10M ft. •n fob mill or equalized with nearest stocking competitor. •o 250 sacks or more. •p 100 sq ft •r per lb. •s 30 lb bag. •t 36" x 108":-10.81 lb/sh; 48" x 144"; 21.7 lb/sh •u 19.31 lb/sh •v fob plant •w 48 x 144" •x 0.11"th. •y 27 gauge •aa 16M lb & up. •bb Per 50 lb bag. •dd add $1.00 cwt boxing •ee tons & up •gg add $2/cwt boxing; $0.75/cwt on skids. •hh Theoretical wt for 48" x 96"; 60.4-lb per sh. •ii 300-bag lots •jj 100-lb bag •mm Theoretical wt: 19.7-lb per sh •nn 2% cash •oo skid packed. •pp type 304 •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •C 15M lb. •D less ½% for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exemp.. •K less ½%, 10 days. •L 5% disc. 30 days. •M 3003: .452 for 1100. •N less 2%, 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton. •R revised. •S add .10/bag under 200 bags. •T 5000# quantity on 4000# skids. •U 30 Msf quantity; $0.245 in 10 Msf quantity. •X per sq ft. •Y per sheet. •Z 6,000 lb or over. •AA 30,000 sf or over

CONCRETE PERFORMANCE REPORT:

Monolithically-cast POZZOLITH concrete lift slabs speed construction of new "twin" apartment buildings

Huron Towers, new twin apartment buildings in Ann Arbor, Michigan, represents the largest scale use of the Youtz-Slick lift-slab method to date.

Two-at-a-time—Concrete floor slabs were placed the full width and length of the building at ground level, then raised into place—two-at-a-time—by hydraulic jacks mounted atop the building columns. The slabs measure 215 ft. x 69 ft. x 9 in. and weigh 830 tons each. Thirty-six jacks were required to lift the gigantic 1,660-ton loads.

No "pour strips"—Ordinarily, with lift slab, each slab is cast in sections which are lifted separately. Pour strips are then formed and placed conventionally. On the Huron Towers project, each floor was cast *monolithically . . . without joints or pour strips* of any kind.

Strength, plus economy—Specifications originally called for a minimum of 6.5 bags of cement for 4000 psi concrete. Preliminary tests, however, showed that the *specified strength could be obtained most economically* by using 5 bags of cement and POZZOLITH . . . and provided the desired reduction in shrinkage that allowed construction of these large slabs without pour strips. This mix design was submitted, approved and used throughout the Huron Towers project. All tests on POZZOLITH ready-mix concrete exceeded the specified strength.

Master Builders MBVR air-entraining agent was also employed in all slab concrete to obtain the air content specified for the outer portion of each slab, which will ultimately be a cantilevered balcony exposed to weathering.

Aside from the record number of liftable slabs and the near-record lifting height, the Huron Towers project includes two other interesting features: The concrete casting operation and the method of winter protection.

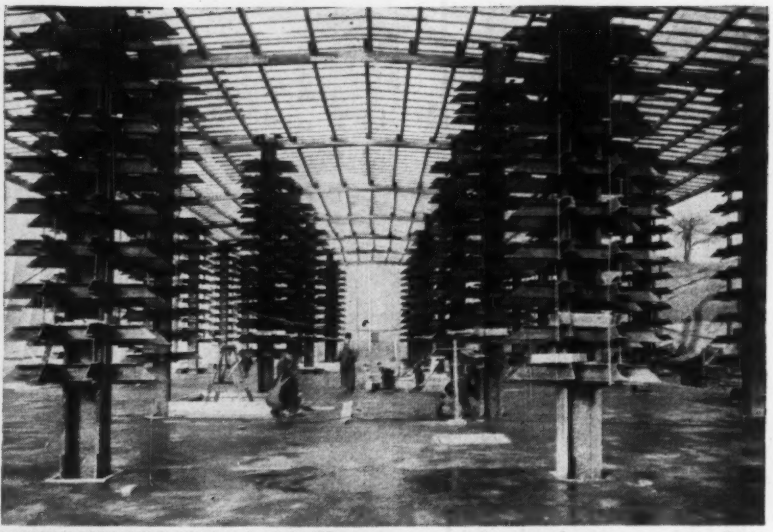
Contractor ingenuity—Since most of the floors in the two buildings are identical, the contractor developed a unique sequence of casting the slabs at the lower-basement floor level. One complete floor, covering nearly 15,000 sq. ft. and containing 410 cu. yd. of concrete, was cast in a three-day cycle. As soon as one crew had completed placement of the 33 tons of reinforcement and conduit for the floor slab in one building, it moved to the other building to begin preparing a new slab. At the same time, another crew placed concrete for the slab in the first building, pumping it into place through an 8-inch line, at a rate of 40 to 60 cu. yd. per hour, from a centrally-located pump.

Weather, or not—This sequence of slab-casting operations was maintained throughout the winter months by protecting the working areas from freezing by enclosing them with 75,000 sq. ft. of lightweight plastic material and maintaining a temperature of approximately 55 F. One-percent calcium chloride was added to the mix to accelerate early strength gain.

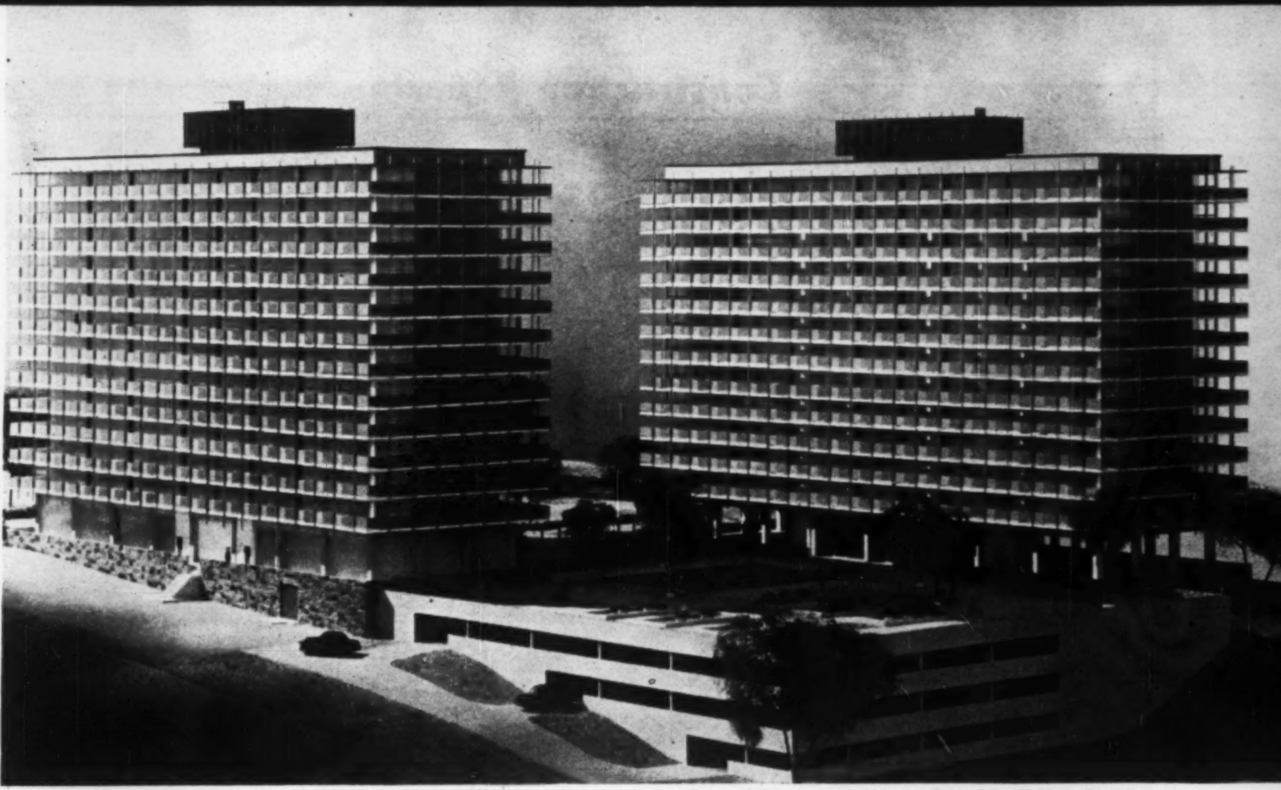
POZZOLITH concrete was used throughout both buildings for (1) *ease of pumping* . . . there were no plugged lines during the entire pumping operation (2) *virtually no honeycomb* . . . despite intricate reinforcing steel and electrical and mechanical work in the slabs (3) *minimized shrinkage and cracking* . . . inspection after lifting showed no cracks through the slab.

Approximately 12,000 of the 25,000 cu. yd. of POZZOLITH ready-mix con-

LIFT SLAB



LOWER BASEMENT FLOORS in both buildings were cast on the ground to serve as casting beds for the liftable slabs. The ground floor and upper basement floor slabs are 14″ plus 2½″ joist-type slabs spanning onto wide flat beams of the same depth. The 12 apartment floors and the roofs are flat slabs, all 9″ thick except the first living floor, which is 10″.



HURON TOWERS, Ann Arbor, Michigan, was designed by King and Lewis Architects, Inc. with structural engineering by R. H. McClurg Associates, Inc.—both of Detroit. Project Manager was B. R. Sloan and Project Engineer, Willard C. Reeder—both of Long Construction Company, General Contractor, Kansas City, Mo. F.H.A. Resident Engineer was Hugh Foley. Lift slab Consulting Engineer was Robert D. Campbell, Kansas City, Mo. Killins Gravel Co. of Ann Arbor supplied the POZZOLITH ready-mix concrete.

TOWERS

crete were used in the lift slabs—the balance went into the foundation and attached parking garage.

Field service—Master Builders field man worked closely with the engineer, contractor and ready-mixed concrete producer on the Huron Towers job to aid in achieving the common goal of uniform, high-quality concrete at lowest cost-in-place.

No matter how large, how small, how unique or how conventional the project, call in the local Master Builders field man. He will show you how concrete produced with POZZOLITH is a more durable and versatile building material . . . superior in performance, quality and economy to plain concrete or concrete produced with any other product.

MAXIMUM LIFTING HEIGHT of roof slab for this building was 145 ft. For its "twin"—142 ft. The number of liftable slabs—15, in this building, sets a record as the greatest number of concrete decks to be lifted in the United States. Total floor area of the two apartment buildings is 465,000 sq. ft.—431,000 of which were lifted.

The Master Builders Company
Division of American-Marietta Co.
Cleveland 18, Ohio
World-wide manufacturing and service facilities

Our 50th Year

MASTER BUILDERS®
POZZOLITH*

*POZZOLITH *is a registered trademark of The Master Builders Co. for its ingredient for concrete which provides maximum water reduction, controls rate of hardening and increases durability.*

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Comr., 170 Douglas St., Hartford, ROAD,

White Oak Excavators, 7 West Main St., Plainville, Conn., CA **$3,357,351**, Proj. 159-91, 8.413 lin. ft. grading, paving reinf.-conc. on section Interstate Rte. 91, incl. 2 bridge structures, vehicular culvert, Hartford and Wethersfield, BA 8/28/61, CA 10/10/61. CD 8/3061, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† **Maryland**—BA 11/28—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, wid'n., deepen MAIN CHANNEL, Chesapeake Bay, CIVENG-18-020-62-7. $5,000,000. Extended date. CD 9/21/61.

HEAVY CONSTRUCTION—LB & CA

▲ **George Tripp, Inc.**, 3260 Elizabeth Lake Rd., Pontiac, Mich., CA **$3,855,298**, est. $3,349,100, Contr. A, SEWERAGE SYSTEM, Parts, A, B, and C, FEASTERVILLE, PA. Lower Southampton Bucks Co., Municipal Auth., Lower Southampton Twp. Bldg., 1035 Bustleton Pike, Feasterville, Pa., BA 9/28/61. CD 10/11/61, under LB.

BUILDINGS—LB & CA

▲ **George F. Driscoll Co.**, 41 E. 42 St., New York 17, N. Y., CA Est. **$47,300,000**, seven 22 story APARTMENTS and five 1 story COMMERCIAL BLDGS., Montrose, Manhattan, Union Aves. and Broadway, BROOKLYN, N. Y. Lindsay Park Housing Corp., Stanley Harte, Sponsor, 350 Fifth Ave., New York 16, N. Y. Kelly & Gruzen, 10 Columbus Circle, New York 19, N. Y., archts.-engrs. CD 9/12/61.

▲ **Adson Builders, Div. Adson Industries, Inc.**, 116-55 Queens Blvd., Forest Hills, N. Y., CA Est. **$10,000,000**, 2 high-rise Park Lane Plaza APARTMENTS, East site, 62,900 sq. ft. over L. I. R.R. tracks at Union Turnpike and Interboro Pkwy., Austin St. and Grenfell St.; West site, 56,500 sq. ft. Burns St., Forest Hills Gardens and Austin St., KEW GARDENS-FOREST HILLS, N. Y. Adson Industries, Inc., 116-55 Queens Blvd., Forest Hills, N. Y. George & Reuben Miller, 505 5 Ave., New York 17, N. Y., archts.

▲ **Blitman Constr. Corp.**, 101 Park Ave., New York 17, N. Y., CA Est. **$3,000,000**, 12 story PENTHOUSE 70x140 ft. Washington Irving House APARTMENTS, 144 E. 17 St., 145-55 E. 18 St. and 166-80 3 Ave., NEW YORK, N. Y. Nassoit-Sulzberger Co., 654 Madison Ave., New York 22, N. Y. Philip Birnbaum, 12 E. 48 St., New York 17, N. Y., archt.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **GEORGIA**—State Hy. Dpt., No. 2 Capitol Square, Atlanta, Zone 3, Bids opened 10/6, ROADS.

Ga.—**Henry Newton Co.**, Seaboard Ave. N.E., P.O. Box 428, Decatur, Ga., LB **$2,042,483**, 4.256 mi. 4-lane grading, constr. 5 double bridge, on Interstate Rte. 16, beginning State Rte. 19, extending eastward along Macon-Savannah Interstate Rte., Laurens Co.;

Ga.—**Shepherd Constr. Co.**, 1800 Briarcliff Rd., Atlanta, Ga., LB **$3,166,481**, 4.433 mi. grading, divided lane paving on Stone Mountain Bypass beginning 826 ft. southwest of intersection of Goldsmith Road, and Memorial Dr., extending northeast and east on new location into U.S. 78 approx. 976 ft. east Rock Bridge Road, DeKalb and Gwinnett Counties. CD 9/26/61.

BUILDINGS—LB & CA

▲ **Virginia Engineering Co., Inc.**, 80-29th St., Newport News, Va., CA **$5,245,000**, OFFICES, Department of Safety-Health-Welfare, Clay St., RICHMOND, VA. City of Richmond, City Hall, Richmond, Va. BA 9/26/61. CD 9/29/61, under LB.

MIDDLE WEST

BUILDINGS—LB & CA

▲ **A. L. Jackson Co.**, 300 W. Washington St., Chicago 6, Ill. CA **$7,000,000**, 17 story OFFICE, Wacker Dr. and Monroe Sts., CHICAGO, ILL. United States Gypsum Co., 300 W. Adams St., Chicago, Ill. CA 10/9/61. CD 6/20/61.

▲ **Hunzinger Constr. Co.**, 4577 North 124th St., Milwaukee, Wis., CA Est. **$4,000,000**, DEPARTMENT-FOOD STORE, MILWAUKEE, WIS. Jared Corp., 2577 North 30th St., Milwaukee, Wis. Rasche Schroeder & Spransy, 601 West Capitol Dr., Milwaukee, Wis., archts. D. H. Gutzmann, 1840 North Farwell Ave., Milwaukee, Wis., assoc. archt. CD 9/19/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—LB & CA

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia., LB **$5,864,828**, est. $5,529,948, (10 bidders), SPILLWAY and ACCESS BRIDGE, Big Bend Dam, Fort Thompson, CIVENG-25-066-62-12, SOUTH DAKOTA. U. S. Eng., 217 North 17th St., Omaha 2, Neb. BA 10/10/61. CD 7/31/61.

▲ **Amis Constr. Co.**, 1647 Exchange Ave., Oklahoma City, Okla., and **Paul Hardeman, Inc.**, 10579 Dale Ave., Los Angeles, Calif., LB **$4,749,000**, est. $5,157,000 (8 bidders), six PUMPING STATIONS, HEADQUARTERS BLDG., Atoka Water Pipe Line, OKLAHOMA CITY, OKLA. Oklahoma Municipal Improvement Authority, First National Bank Bldg., Oklahoma City, Okla. BA 10/11/61. CD 9/25/61.

▲ **Claude Everett Constr. Co.**, 2712 Danville St., Houston, Tex., CA **$3,215,000**, WHARFS NOS. 23, 24 and 25, HOUSTON, TEX. Houston Port Comn., 1519 Capitol St., Houston, Tex. Lockwood, Andrews & Newman, 1010 Waugh St., and Robert J. Cummins, Bankers Mtg. Bldg., both Houston, Tex., engrs. BA 10/11/61. CD 8/15/61.

BUILDINGS—LB & CA

▲ **Leonard Constr. Co.**, 37 S. Wabash Ave., Chicago 3, Ill, CA, design and construct SULFURIC ACID PLANT near HOBBS, N. M. Climax Chemical Co., c/o contractor.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Diego**—BA 11/8—City, Rm. 161, Civic Center Bldg., Zone 1, SEWAGE TREATMENT PLANT, Point Loma. $6,174,000. Plans deposit $25. CD 11/15/60.

▲ **Calif., Los Angeles**—BA 11/21—Bd. Supervs. Los Angeles Co., 500 W. Temple St., MEMORIAL PAVILION and UNDERGROUND GARAGE, Civic Center. $18,000,000. Bids advanced. Welton Becket Assoc., 10000 Santa Monica Blvd., archts. CD 8/14/61.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 10/11, ROAD,

Gordon H. Ball, Gordon H. Ball, Inc., 300 Camille Ave., Danville, Calif., LB **$6,036,000**, (8 bidders) grading, paving 5.3 mi. six lane Freeway U. S. Hy. 99 between south of Mine Ave. and Olive Dr., in Bakersfield, Kern Co. CD 9/6/61.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, ROAD,

Fredickson & Watson Constr. Co., Kirst Constr. Co. and **Jack L. Adams Constr. Co.**, 873 81 Ave., Oakland, Calif., CA **$6,496,507**, grading, paving 15 mi. 4 lane freeway and 1 mi. four lane hy. on US Hy. 6 (Antelope Valley Freeway) between Soledad Canyon Rd. and Red Rover Mine Rd., Los Angeles Co. BA 9/28, CA 10/13. CD 10/3/61, under LB.

▲ **Wunderlich Constr. Co.**, P.O. Box 359, Palo Alto, Calif., LB **$3,438,553**, est. $4,115,700, (5 biddlers), INTERCEPTOR SEWER CONTR. 2, SCHED. 11 for sewage collection, treatment and disposal sys., SAN DIEGO, CALIF. City, Rm. 161, Civic Center Bldg., San Diego 1, Calif. BA 10/11. CD 9/15/61.

BUILDINGS—LB & CA

▲ **Trepte Constr. Co., Inc.**, 1402 Murray Canyon Rd., San Diego, Calif., LB **$3,891,312**, (5 bidders), general contract CLASSROOM BLDG. No. 1, three interconnected concrete bldgs., San Fernando State College, W.O. AD 12 011 C, NORTH RIDGE, CALIF. State Div. Architecture, 107 S. Broadway, Los Angeles, Calif. BA 10/11. CD 9/8/61.

CANADA

BUILDINGS—BA

▲ **Que., Quebec City**—BA 11/10—La Laurentienne Cie d'Assurance-Vie, 480 Grande Allee, 12 story, rein.-con. stone, glass, aluminum OFFICE, 9 story TOWER, Claire Fontaine and Grande Allee. $2,000,000. Fiset & Deschamps, 50 St. Jean St., archts. Halle & Halle, 580 St. Jean St., engrs. CD 7/11/60.

▲ **Que., Montreal** — Bids Asked — Montreal Building Trades Apprentice Training Comn., 5205 Parthenais St., 2 story, concrete APPRENTICE TRAINING CULTURAL CENTER BLDG., Parthenais St. $2,000,000. Extended date. Paul H. Lapointe, 3534 Cote des Neiges Rd., archt. Brouillet & Carmel, 3600 Barclay Ave., engr. CD 10/13/61.

PUERTO RICO

BUILDINGS—LB & CA

▲ **R. P. Farnsworth & Co., Inc.**, Box 3776, San Jose Sta., Puerto Rico, CA Est. **$2,748,000**, 300 unit, 3 floors 31 bldgs. PUBLIC HOUSING, PR-386, AGUADILLA, PUERTO, RICO. Puerto Rico Urban Renewal and Housing Corp., P.O. Box 397, Rio Piedras, Puerto Rico. Guillermety & Ortiz, Box 4789 San Juan, Puerto Rico, engrs. BA 9/1. CD 8/9/61.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲† **Vietnam**—International Cooperation Admin., 815 Connecticut Ave. N.W., Wash. 25, D. C., U. S. A., ROAD,

cancelled bids to have been opened about Oct. 20, 22 km two lane bit. surf. Hy., steel or concrete bridges, concrete culverts, Rte. 1, Ninh Hoa and Nha Trang and between Saigon and Banmethout, IFB-C 1030 Proj. 2. **$3,000,000.** CD 9/14/61.

BUILDINGS—LB & CA

▲ **Bechtel Pacific Corp.**, Melbourne, Australia, and **Bechtel International Ltd.**, London, England, subsidiary Bechtel Corp., 612 S. Flower St., Los Angeles 17, Calif., U. S. A., CA 10,000 long tons per year TITANIUM OXIDE PIGMENT PLANT, BUNBERRY, AUSTRALIA. LaPorte Ltd., Bunberry, Australia.

▲ **Procon Great Britain, (subsidiary Procon, Inc.**, 1111 Mount Prospect St., Des Plaines, Ill., U. S. A.), CA Est. **$4,500,000**, 40,000 b/d REFINERY MOMBASA, KENYA. East African Oil Refineries, Ltd. (Royal Dutch Shell, The Netherlands and British Petroleum Co. Ltd.), London, England. CD 9/17/59.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **DOMINICAN REPUBLIC**—Dpt. P. Wks., Govt. Dominican Republic, Ciudad Trujillo, ROAD,

Cia Constructora Elmhurst C. por A, 680 5 Ave., New York 19, N. Y., U. S. A., CA **$6,000,000** last sector Duarte Hy. from La Vega to Santiago. **(Correction**—contractor). CD 10/2/61, under CA.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Nigeria**—BA 11/1—Secretary, Electricity Corp. of Nigeria, Headquarters, 13 Broad St., Lagos, ELECTRIFICATION PROJ. incl. 9 mi. 33 KV TRANSMISSION LINE, two SUBSTATIONS and four DISTRIBUTION NETWORKS.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

PROPOSED PROJECTS

WATER SUPPLY

▲ **Colo, Pueblo**—City, City Hall, WATER SYSTEM (EXPANSION, IMPROVEMENTS. **$6,000,000.** Simon F. Elliott, 111 E. 5th St., consult. engr. CD 2/17/61.

▲† **D. C., Wash.**—U. S. Eng., 24th St. and Maryland Ave., Baltimore, Md.,

Great Falls Intake structure, Great Falls, Md., **$868,000;**

Dalecarlia Filtration and Chemical Buildings, addns., for D. C. Govt., **$3,240,000** (no appropriation).

Flood Protection, Dalecarlia Reservoir for D. C. Govt., **$2,600,000** (no appropriation).

shops and storehouses, Dalecarlia Reservoir for D. C. Govt., **$1,210,000** (no appropriation).

Floc-Sed Basins 1 and 2, Dalecarlia for D. C. Govt., **$5,500,000** (no appropriation).

Floc-Sed Basin No. 3, Dalecarlia, **$1,960,000.**

McMillan Chemical Bldg., **$1,119,000.**

Fourth High Pumping Station and storage, Fort Reno for D. C. Govt., **$2,020,000** (no appropriation).

Reno Reservoir, 2nd Half for D. C. Govt., **$2,137,000** (no appropriation).

Little Falls Pumping Station addn. for D. C. Govt., **$1,850,000** (no appropriation).

SEWERS, WASTE DISPOSAL

▲ **Calif., Carlsbad**—Vista Sanitation District, Carlsbad, and City of Carlsbad, City Hall, joint SEWERAGE SYS., incl. interceptor and outfall sewers, pumping stations, sewage treatment plant and ocean outfall. **$4,678,500.** To go ahead 1962. CD 9/18/59.

▲ **Mo., St. Louis County**—Metropolitan St. Louis Sewer Dist., 2000 Hampton Ave., St. Louis, Zone 10, 9 mi. SEWERS, **$4,400,000;** TREATMENT PLANT, Coldwater Creek Watershed, **$6,586,000.** Horner & Shifrin, 1221 Locust St., St. Louis, Zone 3, consult. engrs. CD 6/7/57.

▲ **Tex., Dallas**—Dallas County, Comrs. Court, Courthouse, bond election Oct. 21, FLOOD CONTROL, OPEN and CLOSED DRAINAGE, **$20,000,000.**

BRIDGES

▲ **Ill., Chicago**—New York, Chicago & St. Louis R.R. Co., Terminal Tower, Cleveland, O. BRIDGE over Calmuet River. **$14,000,000.**

STREETS AND ROADS

▲ **MAINE**—State Hy. Comn., State House, Augusta, ROADS,

voted **$6,000,000** bonds Oct. 10, highways. CD 9/15/61.

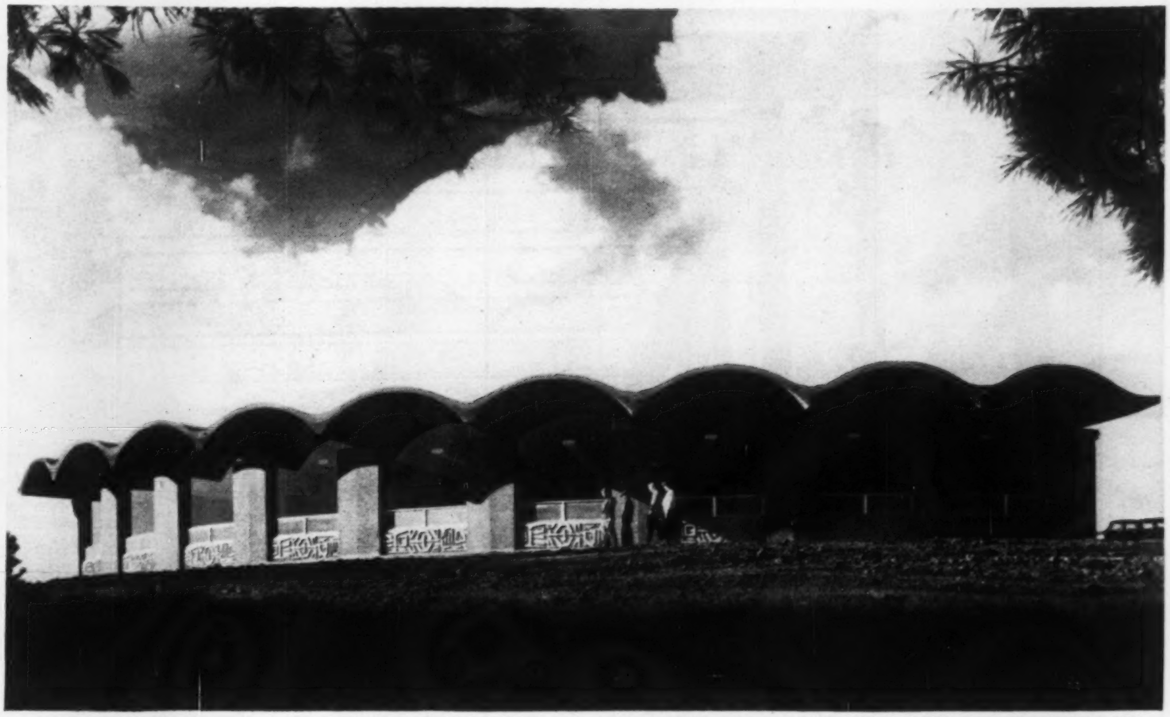
▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROADS,

Clearfield Co.—13.3 mi. sect. Keystone Shortway, from point half mi. east of T.R. 219, eastward, **$13,800,000**, Erdman, Anthony Associates, Inc., 1835 North Third St., Harrisburg, consult. engr.

9.7 mi. sect. Keystone Shortyway (interstate), **$11,170,000**, Yule, Stricklen, Jordan & McNee, Cedar Cliff Drive, Camp Hill, consult. engrs.

six mi. Keystone Shortway and bridge over west branch of Susquehanna River, **$11,770,000**, Brookhart & Tyo, 3501 North Front St., Harrisburg, consult. engrs. F. S. Poorman, c/o owner, engr.

(Continued on page 68)



Goldendale School, Washington County, Wis. Architect: William P. Wenzler, Brookfield, Wis.

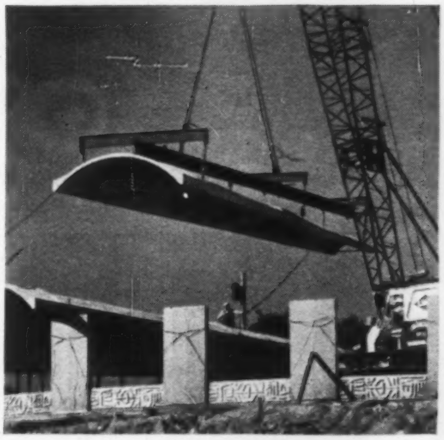
Circular-design school built entirely of concrete for less than $13.20 per square foot!

Near Germantown, Wisconsin, they've replaced the "little red schoolhouse" with a beautiful all-concrete structure of unique circular design. Housing three classrooms, this is the first unit of a projected 8-classroom primary school with auditorium-gymnasium.

The first unit was completed at a cost of less than $13.20 per sq. ft., including all service equipment for the full school. The completed building is expected to cost only $10.00 per square foot.

Concrete's inherent economies make modern design possible at reasonable cost. Thanks to precasting of shell roof elements, costs were reduced and construction speeded. Further economies resulted from the use of precast piers enhanced by the color and texture of exposed aggregate. Precast sculptured panels under the large windows added design interest at low cost. And interior walls are economical concrete block.

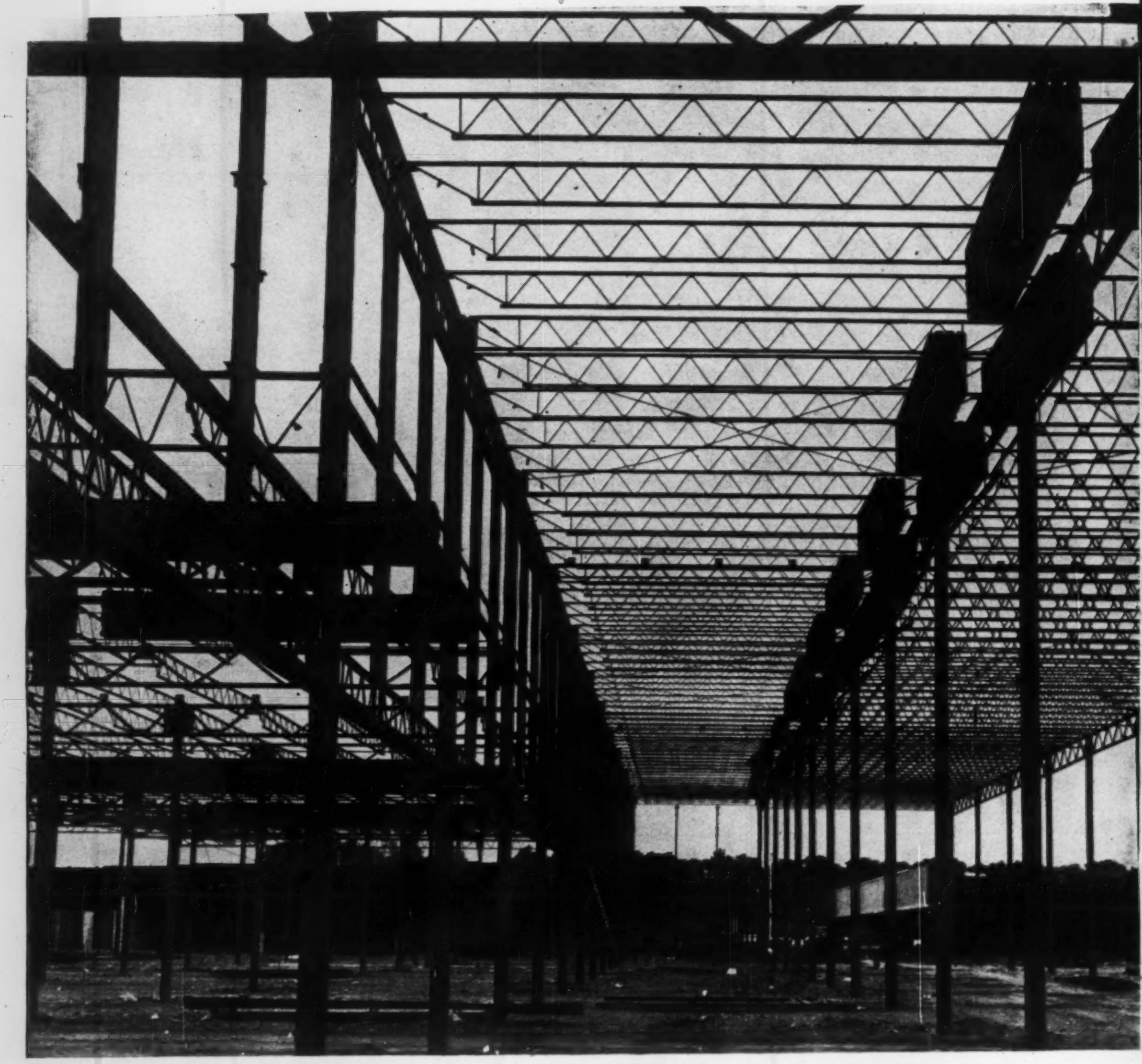
Once again, here's proof that where beauty, structural strength and fire-safety must be combined with economic realities—more and more architects and engineers turn to modern concrete construction. Write for free technical data on concrete shell roof design. (U.S. and Canada only.)



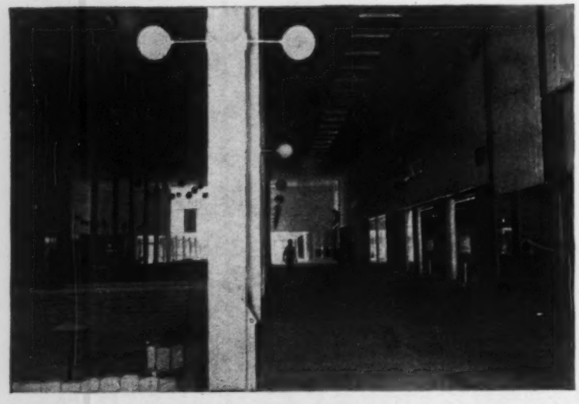
To effect circular design of building, precast concrete barrel roof shells are tapered. They are 57 ft. long, 12 ft. wide at one end, 5 ft. wide at other end. Shells are supported by precast piers.

FOR STRUCTURES...
MODERN
concrete

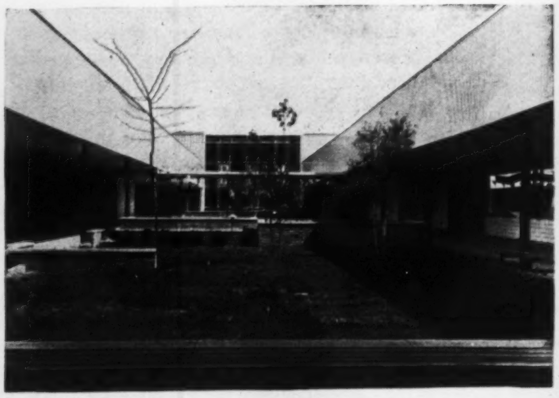
PORTLAND CEMENT ASSOCIATION
Dept. A10d-13, 33 West Grand Avenue, Chicago 10, Ill.
A national organization to improve and extend the uses of concrete



TWO STORIES OF INTERLOCKED STEEL frame the 320′ wide, 25′ high, middle section which houses two department stores. Standardized, interlocking girders and purlins required no bolting, riveting or field welding — reduced engineering, fabrication and construction costs — advanced completion and occupancy dates.

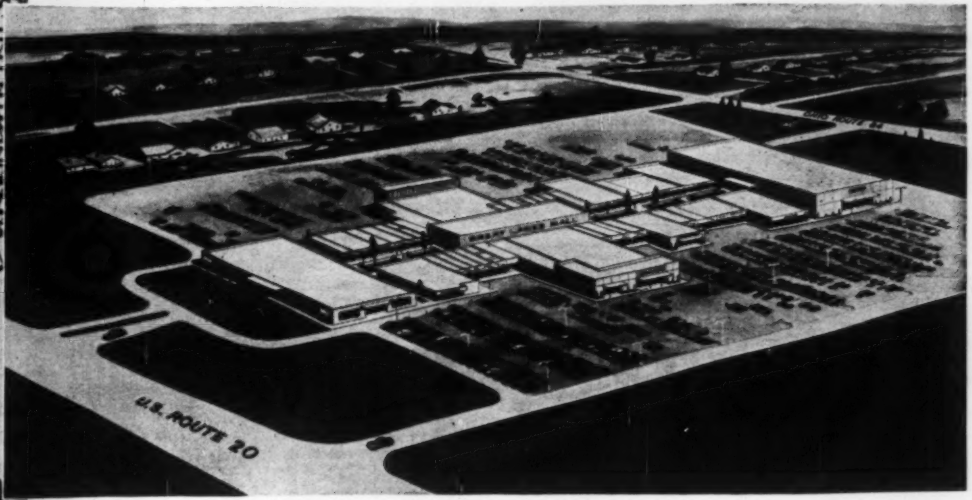


COMPLETELY FIRE-RESISTANT CONSTRUCTION. Masonry fire wall partitions rise unhampered through MACOMBER METAL DECK roof via double framing at roof line. V-LOK columns were embedded in walls. Open web purlins and girders made sprinkler installation easy.



870 FOOT LANDSCAPED CENTRAL CONCOURSE boasts bench-filled garden and rest areas. Two-story, 25′ ceiling height, enclosed building — featuring arcade-type display windows — is focal point of concourse. Canopied retail units surround area.

1300 tons of high-strength MACOMBER **V-LOK** frame 350,000 sq. ft. Great Lakes Mall at Mentor, Ohio



The Edward J. DeBartolo Co. of Youngstown, Ohio — designers and builders — specified Macomber V-LOK in planning their latest of over 70 shopping centers. Previous and extensive experience with Macomber V-LOK — its speed, rigidity, and economy — was so much to their satisfaction that no other methods were considered.

When fully completed, the project will comprise 50 units on 14 acre tract. Paved parking for 5,000 cars will be provided.

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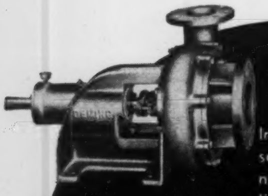

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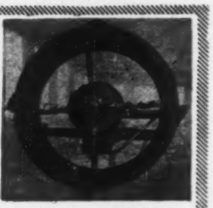

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WRITE FOR CAT. H-60

TEMPLETON, KENLY & CO.
2553 Gardner Road Broadview, Illinois

(Continued from page 64)

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., Don Mills ROAD EXTENSION, north from York Mills Rd. to Steeles Ave., **$3,750,000** (3 year program).

EARTHWORK, WATERWAYS

▲† **California**—U. S. Eng., 1209 8 St., Sacramento, DEEP WATER SHIP CHANNEL, Sacramento River. **$4,300,000** (appropriated). CD 9/23/58.

▲† **New Jersey**—U. S. Eng., 925 New Federal Bldg., Phila. 29, Pa., DREDGING 40 ft. CHANNEL Delaware River. **$12,000,000** (appropriated).

▲† **Texas**—U. S. Eng., P.O. Box 1229, Galveston, IMPROVING Buffalo Bayou and tributaries, Brays Bayou, **$3,500,000** (appropriated); Buffalo Bayou Channel (River Oaks area) **$400,000** (appropriated). CD 9/22/60.

AIRPORTS

▲ **Fla., Miami**—Dade County Port Auth., 10th Floor County Courthouse, 3 story, 625 x 190 ft AIRWAYS EXPANSION PROGRAM, 36th St. side of Miami International Airport for Pan American Airways, **$5,000,000.**

UNCLASSIFIED

▲ **Alaska, Anchorage**—City, City Hall, defeated **$4,000,000** bonds Oct. 3, TELEPHONE SYS. EXPANSION, incl. EXCHANGE BLDG., PLANT IMPRVS. CD 8/31/61.

▲ **Calif., Ventura**—Ventura Co., Court House, voted **$3,500,000**, bonds Oct. 3, completion Ventura County SMALL BOAT HARBOR and Oxnard Beach, 375 boat slips, Hueneme. CD 9/27/61.

▲† **Colo., Colorado Springs**—U. S. Eng., 1709 Jackson, Omaha, Neb., NORAD HEADQUARTERS, **$10,400,000** (appropriated). CD 5/8/59.

▲ **Hawaii**—Japan-American Telephone & Telegraph Co., 195 Broadway, New York, N. Y., 5,500 mi. COMMUNICATIONS CABLE from Hawaii via Midway, Wake and Guam to Japan. **$55,000,000.** FPC approved.

▲† **Kansas, Oklahoma and Texas**—Bureau of Mines, Dpt. Interior, 514 Barfield Bldg., Amarillo, Tex., HELIUM PIPE LINES FROM PLANTS, Bushton, Kan. to Amarillo, Tex. for storage. **$8,000,000-$9,000,000.** Williams Brothers Co., National Bank Tulsa Bldg., Tulsa, Okla., consult. engr.

▲ **N. Y. Flushing**—General Motors Corp., Mr. A. H. Belfie (In Charge), General Motors Bldg., Detroit, Mich., plans by Harrison & Abramowitz, 630 5 Ave., New York 20, N. Y., EXHIBITION PAVILION, World's Fair Exhibit. **$5,000,000.** CD 7/12/61.

▲ **Tex., Dallas**—Dallas Power & Light Co., Dallas Power & Light Co. Bldg., downtown electric POWER SUB-STATION. **$4,000,000.** CD 5/15/59.

PUBLIC BUILDINGS

▲ **Ala., Mobile**—City, City Hall, and Alabama State Docks Dpt., State Docks Bldg., SUGAR REFINERY on Blakeley Island. **$10,000,000.** Henderson Sugar Co., Mobile, lessee. Palmer & Baker, Inc., 2460 Government St., consult. engrs. CD 11/21/58, under Unclassified.

▲ **Calif., Berkeley**—Regents of University of California, 2 Barrow Lane, plans by De Mars, Esherick & Olsen, 2065 Powell St., San Francisco, 3 story 210,000 sq. ft. U-shaped multi tiered tower, rein.-con. partly precast concrete COLLEGE of ENVIRONMENTAL DESIGN. **$4,500,000.** Isadore Thompson, 133 Kearny St., San Francisco, consult. engr. CD 2/20/61.

▲† **Calif., Los Angeles**—Veterans Admin., Munitions Bldg., Wash., D. C., 960-bed HOSPITAL. **$25,000,000** (planning money appropriated).

▲ **Calif., Oxnard**—Oxnard Elementary School Dist., 255 Palm Dr., **$4,500,000** bond election Dec. 5, SCHOOLS. CD 4/14/59.

▲ **Calif., Oxnard**—Oxnard Union High School Dist., 309 S. "K" St., **$6,600,000** bond election Dec. 5, (Three Year School Program) to incl. two HIGH SCHOOLS and SCHOOLS ADDNS.

▲† **Ga., Atlanta**—Veterans Admin., Munitions Bldg., Wash., D. C., 500 bed HOSPITAL, **$14,500,000** (planning money appropriated).

▲ **Ill., Lemont**—U.S. Atomic Energy Comm., 9800 S. Cass Ave., Argonne, plans by Leo A. Daly Co., 8600 Indian Hills Dr., Omaha, Neb., HIGH ENERGY PHYSICS RESEARCH LABORATORY, Argonne National Laboratory, **$6,900,000.** CD 10/12/61.

▲† **Ill., Lemont**—U. S. Atomic Energy Comn., 9800 S. Cass Ave., Argonne, HIGH ENERGY PHYSICS RESEARCH LABORATORY, Argonne National Laboratory. **$6,900,000.**

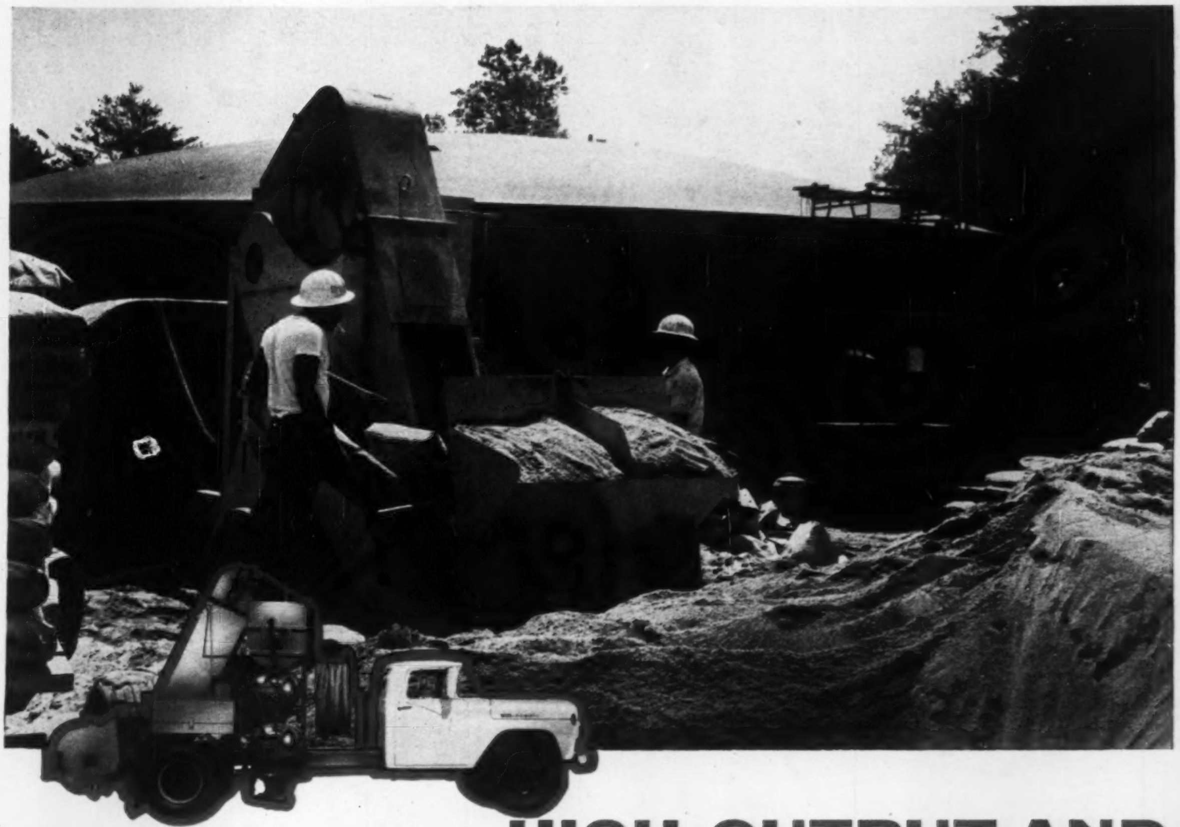
▲† **Mass., Hudson**—U. S. Eng., 424 Trapelo Rd., Waltham, Zone 54, BUILDINGS, Quartermaster Research and Engineering Center. **$3,400,000** (appropriated).

▲ **Mo., Columbia**—Curators University of Missouri, 116 Jessee Hall, plans by Hellmuth, Obata & Kassabaum, Inc., 315 N. 10 St., St. Louis 1, Mo., two 8 story T-shaped RESIDENCE HALLS and 2 story DINNING HALL. **$5,800,000.** Bids late in 1961 or 1962. CD 1/26/56.

▲ **N. J., Jersey City**—Bd. Freeholders Hudson Co., Administration Bldg., 595 Newark Ave., plans by Comparetto & Kenny, 880 Bergen Ave., ADMINISTRATION BLDG. ADDN. at site. **$3,448,500.** Bids in early Summer. CD 2/28/58.

▲ **N. Y., Brooklyn**—Bureau Constr., Bd. Educ., 42015 Crescent St., Long Island City, plans by Antonin Raymond & L. L. Rado, 101 Park Ave., New York, N. Y., Proj. E-525, Central Brooklyn HIGH SCHOOL, 19

(Continued on page 72)



On So. Carolina Water Reservoir project: HIGH OUTPUT AND MOBILITY KEYNOTE OPERATION OF RIDLEY CONCRETE GUN RIG

On the construction of the R. B. Sims Prestressed Water Reservoir in Spartanburg, South Carolina, contractor The Crom Corporation, prestressed tank builders, of Gainesville, Florida proved that concrete gunning with Ridley equipment pays off—in savings of time, and in a substantial increase of concrete placed. Working in a restricted area and placing the concrete on high vertical walls, the output of the Ridley C-3VD rig was always ahead of the crew, enabling the contractor to set his own pace and get the job done in the fastest time. Asked what he thought of the Ridley rig, president of the construction firm, Ted Crom, had this to say: "We bought the Ridley with a hope to increase our production. We like it. We are contemplating purchase of another. We find we can get increased output and we like its mobility."

The experience of The Crom Corporation with the Ridley concrete gunning rig is far from unique. Contractors throughout the country and abroad are finding that gunning concrete with Ridley is faster, more accurate and more profitable. Ridley rigs are available in models with outputs ranging from 10 to 20 tons per hour, truck or trailer mounted. Ridley rigs are ruggedly built to deliver years of service; the first rig sold five years ago is still operating and making money for its owner.

Get the full story on how you can increase your profits through gunning concrete with Ridley equipment. Mail in the coupon today.

RIDLEY

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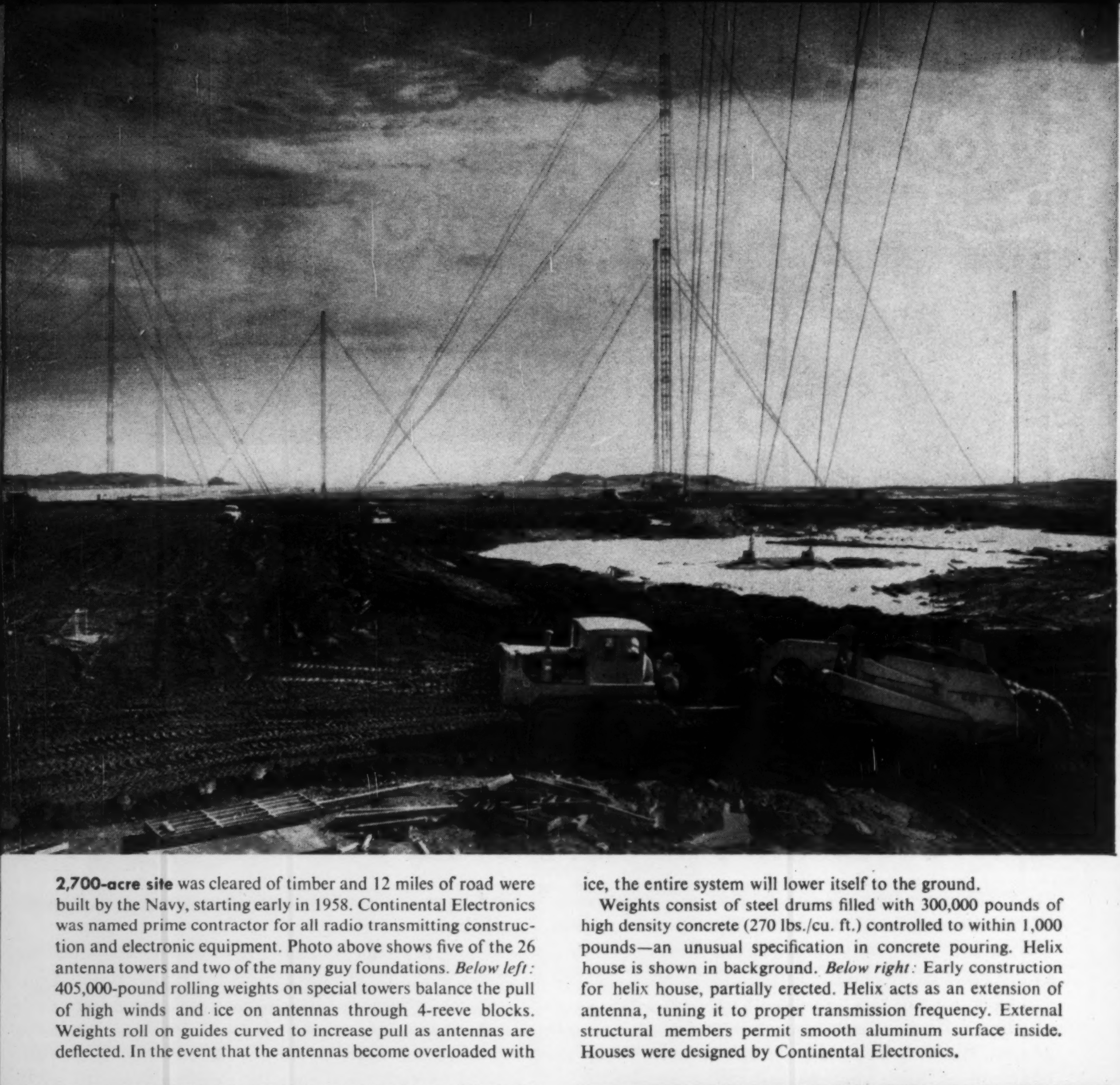
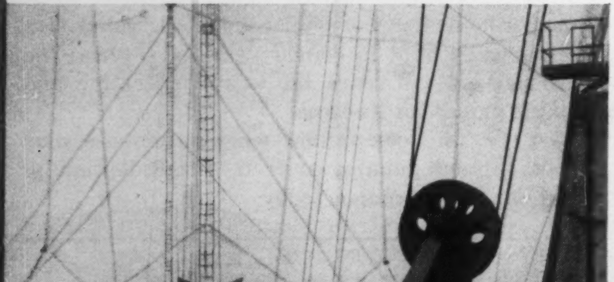
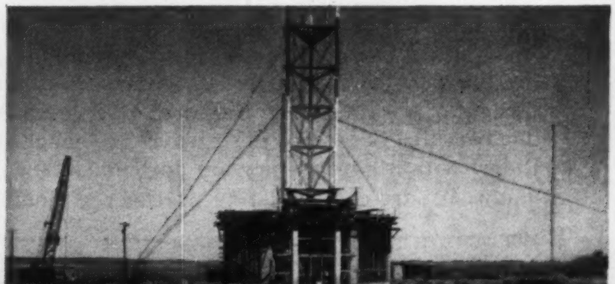


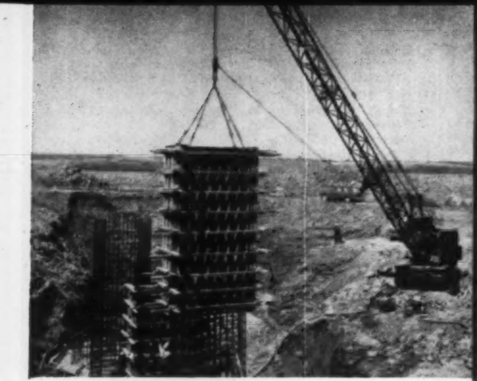
2,700-acre site was cleared of timber and 12 miles of road were built by the Navy, starting early in 1958. Continental Electronics was named prime contractor for all radio transmitting construction and electronic equipment. Photo above shows five of the 26 antenna towers and two of the many guy foundations. *Below left:* 405,000-pound rolling weights on special towers balance the pull of high winds and ice on antennas through 4-reeve blocks. Weights roll on guides curved to increase pull as antennas are deflected. In the event that the antennas become overloaded with ice, the entire system will lower itself to the ground.

Weights consist of steel drums filled with 300,000 pounds of high density concrete (270 lbs./cu. ft.) controlled to within 1,000 pounds—an unusual specification in concrete pouring. Helix house is shown in background. *Below right:* Early construction for helix house, partially erected. Helix acts as an extension of antenna, tuning it to proper transmission frequency. External structural members permit smooth aluminum surface inside. Houses were designed by Continental Electronics.

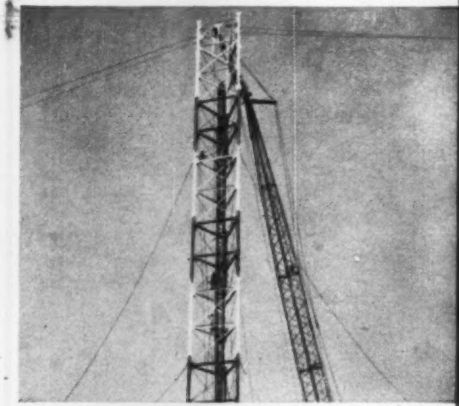




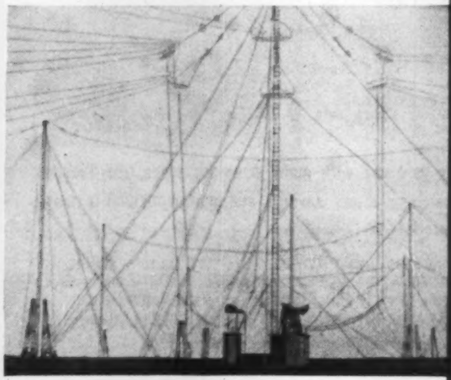
Knowing how one contractor meets the demands of time, efficiency and profit may help you in your next job.



Lowering form over steel reinforcements prior to pouring concrete foundation. 90,000 cubic yards of concrete and 15,000 tons of reinforcing steel were used. About 1,300 people were employed during construction. 2,500,000 cubic yards of earth were moved. 2,200 miles of grounding cable were imbedded 12" in the earth.



Raising gin pole through center of tower after using crane to maximum height. Supported by the towers, gin poles were used up to 1,000 feet. There were no fatal accidents. Tower mid-sections are heavier to resist horizontal antenna pull-off load. Peripheral towers had outward camber so as to assume vertical position under antenna load.



Inner circle of one array. In each array there is a center tower 979.5 feet high surrounded by an inner ring of six 875-foot towers and an outer ring of six towers 799 feet high. Ice can be melted from antennas by 4,000,000-watt electrical heating. Either of the two antenna arrays can be heated while the other transmits.

How Continental Electronics builds giant U.S. Navy radio station despite 40-mile winds and –25° F. cold

26 giant towers, ranging up to 979.5 feet high, mark the site of the recently completed U.S. Navy Very Low Frequency Radio Station at Cutler, Maine—largest and most powerful Navy radio installation for surface fleet and submarine communication. Total project cost $68.5 million. Continental Electronics Manufacturing Company was prime contractor for $47 million. Transmitting capacity is 2,000,000 watts. The two antenna arrays of thirteen towers each cover an area greater than 11 Pentagon buildings. Other installations include an operations building, helix houses and a power plant to handle electrical requirements.

Navy clearance of the site was started in the spring of 1958 after which Continental Electronics Manufacturing Company was brought in as prime contractor. The Navy Bureau of Yards and Docks was the contracting agency for the Bureau of Ships. Construction was pushed to completion one year ahead of schedule. No seasonal weather concessions were made. Tower and guy foundations were poured at temperatures as low as —25° F. using heated concrete, protected while setting. Tower construction was carried on even in gale winds. Severe weather increased the difficulties of operating mechanical equipment.

Mobil on-site co-operation was used to aid in organizing lubrication and preventive maintenance. This included check sheets and other control records, lubricating truck design, inventory control and engineering service. Mobilgas, Mobilfuel Diesel, Delvac, Mobilgrease, and Mobilube were the principal Mobil products supplied to both Continental and its subcontractors.

What you can expect from Mobil on your job

Your skill is in construction. Mobil backs you with its skill in guarding the life and efficiency of costly mechanical equipment. You get this for the asking, right on the job—a complete program to help you cut costs, increase the availability and life of equipment and promote safety. Mobil brings you the benefits of: (1) skilled engineering service, (2) quality products, (3) close relationship with equipment builders, (4) lubricant and application analysis and (5) convenient location of its bulk plants for prompt delivery. For further information about how we can help you in these five important areas, write to us.

Mobil

MOBIL OIL COMPANY, 150 East 42nd Street, New York 17, N. Y.

(Continued from page 68)

Ave. and 58 St., Bensonhurst Area, Brooklyn Boro. $6,750,000. CD 1/25/60.

▲ **N. Y.,West Point**—U. S. Eng., 111 E. 16 St., New York, Zone 3, BUILDINGS, U. S. Military Academy. **$4,000,000** (appropriated). CD 10/5/60.

▲† **N. C., Oteen**—Veterans Admin., Munitions Bldg., Wash. 25, D. C., Phase I, CLINIC, 400 bed BUILDING, **$8,500,000.** $2,567,000 (appropriated). CD 10/5/59.

▲† **S. C., Charleston** — Veterans Admin., Munitions Bldg., Wash., D. C., 500 bed HOSPITAL, **$10,000,000** (appropriated). CD 4/13/61.

▲ **Que., Jonquiere**—Ministry of Youth & Social Welfare, Parliament Bldgs., Quebec City, plans by Bertrand Dallaire, 359 St. Dominique St., TECHNOLOGICAL INSTITUTE, north Talbot Blvd. **$3,500,000.** Jean Guy Carrier, 341A St. Dominque St., consult. engr.

COMMERCIAL BUILDINGS

▲ **Calif., Oakland**—Thunderbird International Hotel Corp., 525 N. Sepulveda Blvd., El Segundo, HOTEL. **$9,000,000.** Bids January 1963.

▲ **Ga., Atlanta**—Norris P. Burns, 1731 Carter Circle, East Point, will not construct APARTMENT. **$4,000,000.** Project abandoned. Finch, Alexander, Barnes, Rothschild & Paschal, 70 Fairlie St., NW, archts. CD 6/14/61.

▲ **Idaho, Boise**—Bank Realty Co., c/o Bank of Idaho, lessee 119 N. 8th St., plans by W. C. Kruger & Assocs., 227 E. Palace Ave., Santa Fe, N. M., 12 to 15 story BANK and OFFICE, **$5,000,000.** CD 7/21/61.

Ind., Fort Wayne—Winfield C. Moses & Assocs., 5415 S. Hanna St., garden APARTMENTS near Eagle Rock, **$800,000.**

▲ **Mich., Warren-Detroit**—Macomb Hospital Assoc., 1420 St. Antoine St., Detroit, 200-bed HOSPITAL; 12 Mile and Hoover Rd. **$5,000,000.** Constr. possibly 1962. CD 1/26/61, under South Macomb Hospital Corp., as owner.

▲ **Minn., Minneapolis**—International Properties, Inc., 212 Sixth St. S., plans by J. A. Pruyn, 119 E.18 St., New York, N. Y., two 500 unit River Towers RESIDENTIAL APARTMENTS, between South First and Second Sts., and Nicollet and S. Third Aves. **$7,000,000.** Bids 1962.

▲ **Minn., Minneapolis**—Northern States Power Co., 15 South 5 St., plans by Ellerbe & Co., archts.-engrs., 333 Sibley St., St. Paul, 5 story all electric 145x275 ft. OFFICE, Nicollet Ave. between Fourth and Fifth Sts. **$7,000,000.** Bids probably 1962.

▲ **Minn., Minneapolis**—Northwestern National Life Insurance Co., 400 Oak Grove St., plans by Minoru Yamasaki & Assocs., 1025 East Maple St., Birmingham, Mich., 4 story, bsmnt., 260,000 sq. ft. HOME OFFICE, Washington Ave. between Hennepin and Marquette Aves. **$6,000,000.** Bids 1962. CD 9/29/60.

▲ **Minn., Minneapolis**—Sheraton Corp. of America, 470 Atlantic Ave., plans by Cerny Assocs., Inc., archt.-engr., 300 First National Concourse Bldg., 17 story HOTEL, Nicollet Ave., Marquette Ave., S. Third Ave. and Fourth St. **$9,000,000.** Bids soon. CD 9/29/60.

▲ **N. J., Hackensack**—Hackensack Hospital Assn. of Hackensack General Hospital, 22 Hospital Place, plans by Crow, Lewis & Wick, 200 Fifth Ave., New York, N. Y., 6 story, 120 bed HOSPITAL WING, Hospital Place. **$3,300,000.** A. A. Abdalian, 468 Park Ave. South, New York 16, N. Y., struc. engr. CD 6/9/59.

▲ **N. Y., Hartsdale**—Archdiocesan Bldg. Comn., 451 Madison Ave., New York, Zone 22, plans by Charles Luckman Assocs., 680 5 Ave., New York, Zone 19, Cure D'Ars SEMINARY between Ridge Rd. and Central Park Ave., **$5,000,000.** CD 11/17/60, under N.Y., Harriman.

▲ **N. Y., New York**—New York Medical College, 20 E. 106 St., Zone 29, plans by Rogers & Butler, 219 E. 44 St., Zone 17, 10 story, penthouse LABORATORY and MEDICAL COLLEGE, 26 E. 106 St. **$3,750,000.** Syska & Hennessey, Inc., 144 E. 39 St., Zone 16, mech. engrs. Purdy & Henderson Assocs., 1 Madison Ave., Zone 10, struct. engrs. CD 6/12/61.

▲ **O., Parma Heights**—Education Housing, Inc. c/o Weinberg & Tears, archts. Citizens Bldg., Cleveland, Zone 14, two 8 story 260 suite TWIN TOWER APARTMENTS for retired teachers, 7 acre site, Day Dr. **$3,200,000.**

▲ **O., Zanesville**—Bethesda Hospital, Zanesville, 208 bed HOSPITAL, N. Maple St., **$4,500,000.** CD 7/15/57. Bids 1962.

▲ **Pa., Warrington**—Palomino Corp., c/o Joseph Barness, Doylestown-Willow Grove Pike, Warrington, RESIDENTIAL DEVELOPMENT (200) Valley Rd., **$3,500,000.** Constr. Spring 1962.

▲ **Tex., Dallas**—Carr P. Collins Trust, Fidelity Union Life Bldg., DEPARTMENT STORE. **$5,000,000.** Sanger-Harris Dpt. Stores, Main and Lamar Sts., lessee. CD 9/28/61, under Sanger-Harris Dpt. Stores, as owner.

▲ **B. C., Victoria**—Westward Ho, c/o A. C. Smith & Assocs., consult. engrs., 1349 Burrard St., Vancouver, 16 story, steel, concrete RETIREMENT APARTMENT HOTEL, Cobble Hill Dist., just outside Victoria. **$6,000,000.**

▲ **Ont., Toronto**—Irwin Burns and Murray Webber, developers, 141 Bloor St. West Ltd., 33 Isabella St., COMMERCIAL-RESIDENTIAL DEVELOPMENT, incl. 12 story office for Encyclopedia Britannica of Canada Ltd., shopping mall with stores on 1st and 2nd floors, 11 story apartment, south side Bloor St., **$10,000,000.** Constr. late 1962.

INDUSTRIAL BUILDINGS

▲ **Del., Wilmington**—Shell Oil Co., 50 W 50th St., New York, N. Y. OIL REFINERY and CHEMICAL PLANTS, Blackbird Hundred, near here. **$80,000,000,** incl. equip. Stone & Webster Engineering Co., 49 Federal St., Boston, Mass., consult. engr.

▲ **Mont., Helena**—Permanente Cement Co., (sub. Henry J. Kaiser Co.), Kaiser Center, Oakland, Calif., CEMENT PLANT, near here. **$10,000,000.** (CORRECTION-estimated cost). CD 10/5/61.

▲ **Pa., Eddystone**—Israel & Gold, c/o Joseph J. & Reynold H. Greenberg, 117 S 17th St., Phila., 36 acres, INDUSTRIAL PARK, Over **$5,000,000.**

▲ **Tenn., New Johnsonville**—Consolidated Aluminum Corp., Jackson, ALUMINUM PLANT, near here. **$28,000,000.**

▲ **Tex., Fort Worth**—Carling Brewing Co., 9400 Quincy St., Cleveland, O., plans by Preston M. Geren, 1607 Fort Worth National Bldg, 1,000,000 barrel cap. PLANT Blk. S. Freeway, **$8,000,000-$10,000,000** plant; $10,000,000-equipment. Kapelle, Wright & Mac Leod, Ltd., 531 Younge St., Toronto, Ont., consult. engrs. CD 2/3/61.

▲ **Tex., Victoria**—South Texas Electric Cooperative, Inc., P.O. Box 2178 ELECTRIC STEAM GENERATING PLANT, on Guadalupe River, between Nursery and Mission Valley, 12 mi. north of here, **$9,000,000;** ELECTRIC PLANT, REPAIR SHOP, 12 mi. north of here, **$250,000.** Laramore, Douglass & Popham, 332 S. Michigan Ave., Chicago, Ill., and Roy Krezdon, Box 935, Austin, consult. engrs. Site changed. CD 9/12/61, under, Goliad Tex;

AMERICANS ABROAD

▲ **India, Rayasthan**—Jolan Bros., Jolan House, 62 Ballygung-Circular Rd. (1 Rainey Park), Calcutta 19, India. FERTILIZER PLANT. **$40,000,000.** (Govt. has granted conditional license). Vitro Engineering Corp., 261 Madison Ave., New York 16, N. Y. U.S.A., engrs.

LATIN AMERICA

▲ **Uruguay, Montevideo**—Govt. of Uruguay, Montevideo, impr. WATER SUPPLY SYS. **$5,743,000.**

FOREIGN

▲ **Australia, Kwinana**—Broken Hill Proprietary Co., Essington Lewis House, 500 Bourke St., Melbourne, integrated STEEL WORKS (17 Year Program). Over **$90,000,000.**

For additional reports see CONSTRUCTION DAILY NEWSLETTER

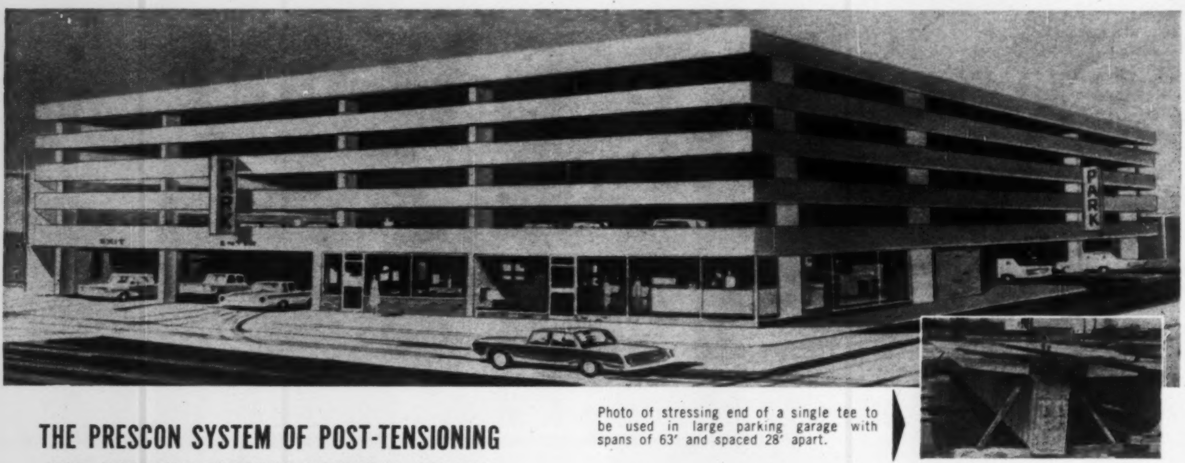


Photo of stressing end of a single tee to be used in large parking garage with spans of 63′ and spaced 28′ apart.

THE PRESCON SYSTEM OF POST-TENSIONING FOR PARKING GARAGES PROVIDES DESIGN FLEXIBILITY AND ECONOMY

Houston's parking problem will be reduced by the Allright, Inc. parking garage* (250 car capacity and 3000 sq. ft. of retail space). Using poured-in-place, pan type construction; joists are 18½" deep, maximum spans of 50′6", maximum bay width 43′6". Slabs covering the roof and retail areas are post-tensioned to render them waterproof.

Parking garages, nation-wide, have used these other types of construction with the Prescon System of post-tensioning: (1) Lin tees with stressed poured-in-place slabs, (2) dia-grid poured in place, (3) precast prestressed elements, (4) lift slabs.

For job site or yard use with many structure types, the Prescon System of post-tensioning offers savings and design flexibility using readily available materials.

Other parking garages using Prescon System: Dalton, Dallas; 1st Nat'l Motor Bank, Longview, Texas; Major Oil Company, downtown, Houston; Beverly Hills, (Calif.); Am. Nat'l Bank, Denver; Bd. of Trade, Kansas City; Hollywood Legion Bowling, (Calif.); Remington-Rand and Baldwin Chevrolet, Los Angeles.

*Consulting Engineers: Mullen and Powell, Dallas
Contractor: Spaw-Glass, Inc., Houston

PRESCON
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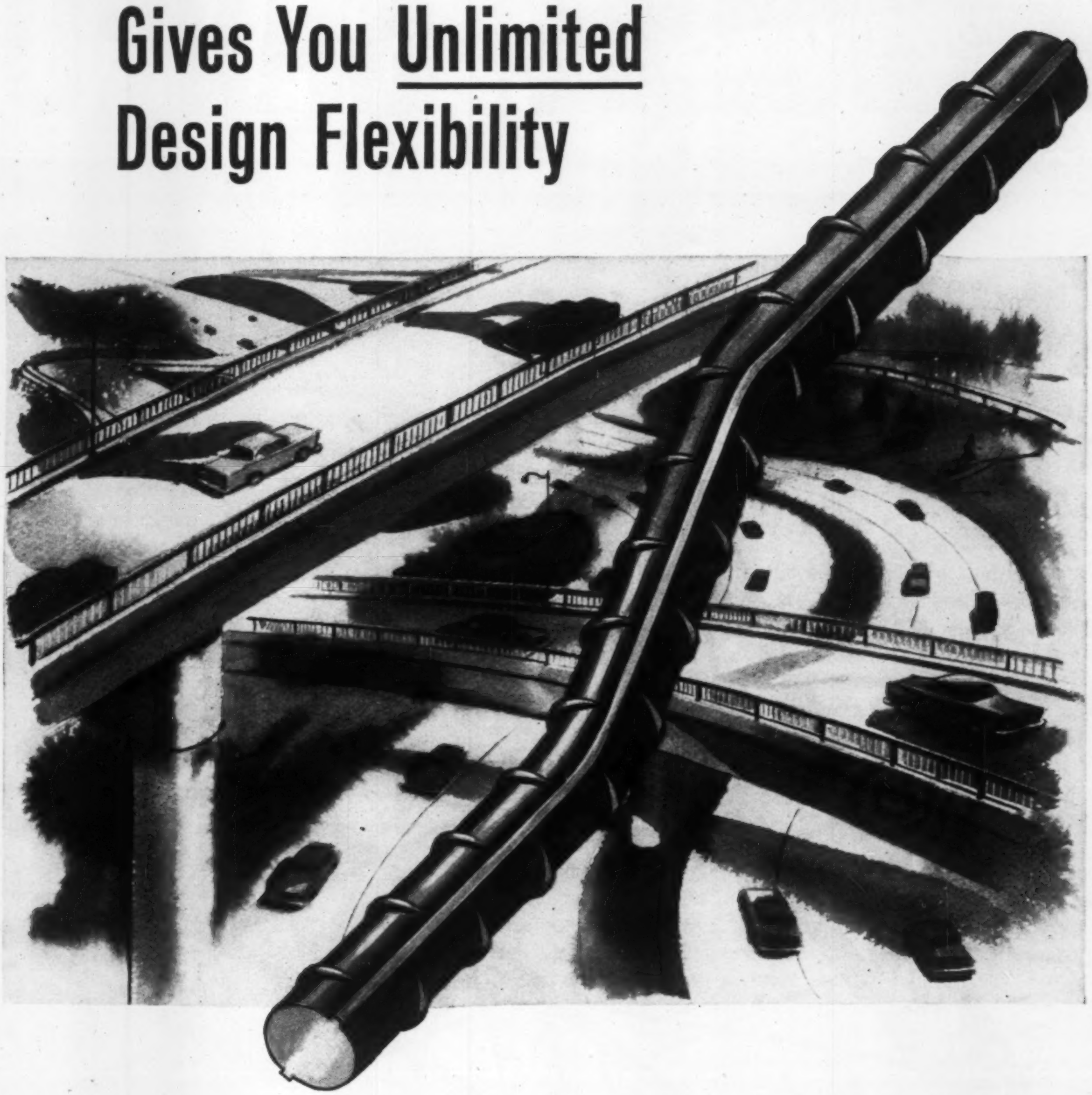
Monolithic REINFORCED Concrete Gives You Unlimited Design Flexibility



Monolithic reinforced concrete provides complete freedom to meet the requirements of terrain and traffic load—greater opportunity for unlimited creative design. Because of its lower cost—proved by government cost comparisons over a three-year period—it further provides greater construction economies than other structural materials.

Concrete Reinforcing Steel Institute
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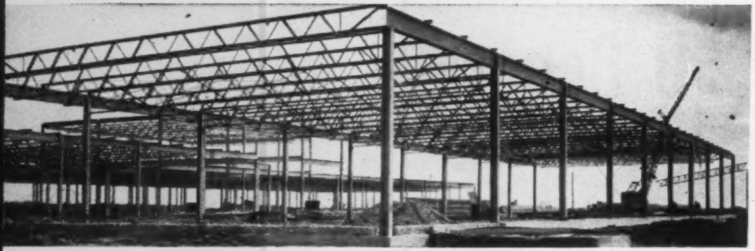
Chicago 3, Illinois

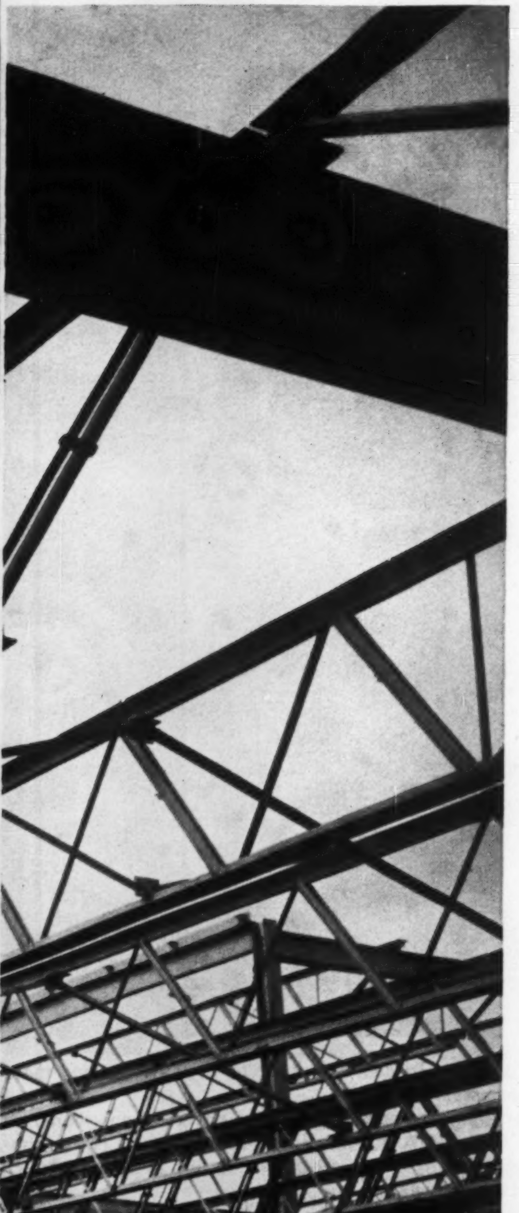
10-61



SAVED:

This mark tells you a product is made of modern, dependable Steel.

$2500 ...by using USS A36 Steel



"We submitted two bids for fabricating the long span steel joists for the new Mallory Controls Company (a Division of P. R. Mallory & Co., Inc.) plant to be built in Frankfort, Indiana," said Mr. Sidney L. Berger, president of The Berger Steel Company, Inc. "One was for A7 steel, the other for A36 steel. The higher strength of A36 steel cut the total tonnage by approximately 18 tons. This not only lowered our bid, but it also lowered shipping and handling costs. We figured the total material savings with A36 steel to be approximately $2500."

Mallory Controls Company, the architects, the contractor, and the fabricator were quick to see the weight- and money-saving advantages of A36 steel. Unfortunately, A36 was not available by specification in time to be incorporated in all sections of this structure. The contracts for the new plant were let in November, 1960 . . . only one month after the introduction of A36 steel. Had A36 been available for beams and columns, *as it now is,* additional savings could have been passed directly on to the owner. There are 200 tons of A36 steel in the top and bottom chords of the joists, fabricated in 60, 50, and 25-foot lengths. Long span joists were used to provide wide bays for continuous line production. When completed, there will be 130,000 square feet of floor space for manufacturing and 20,000 square feet for offices and cafeteria.

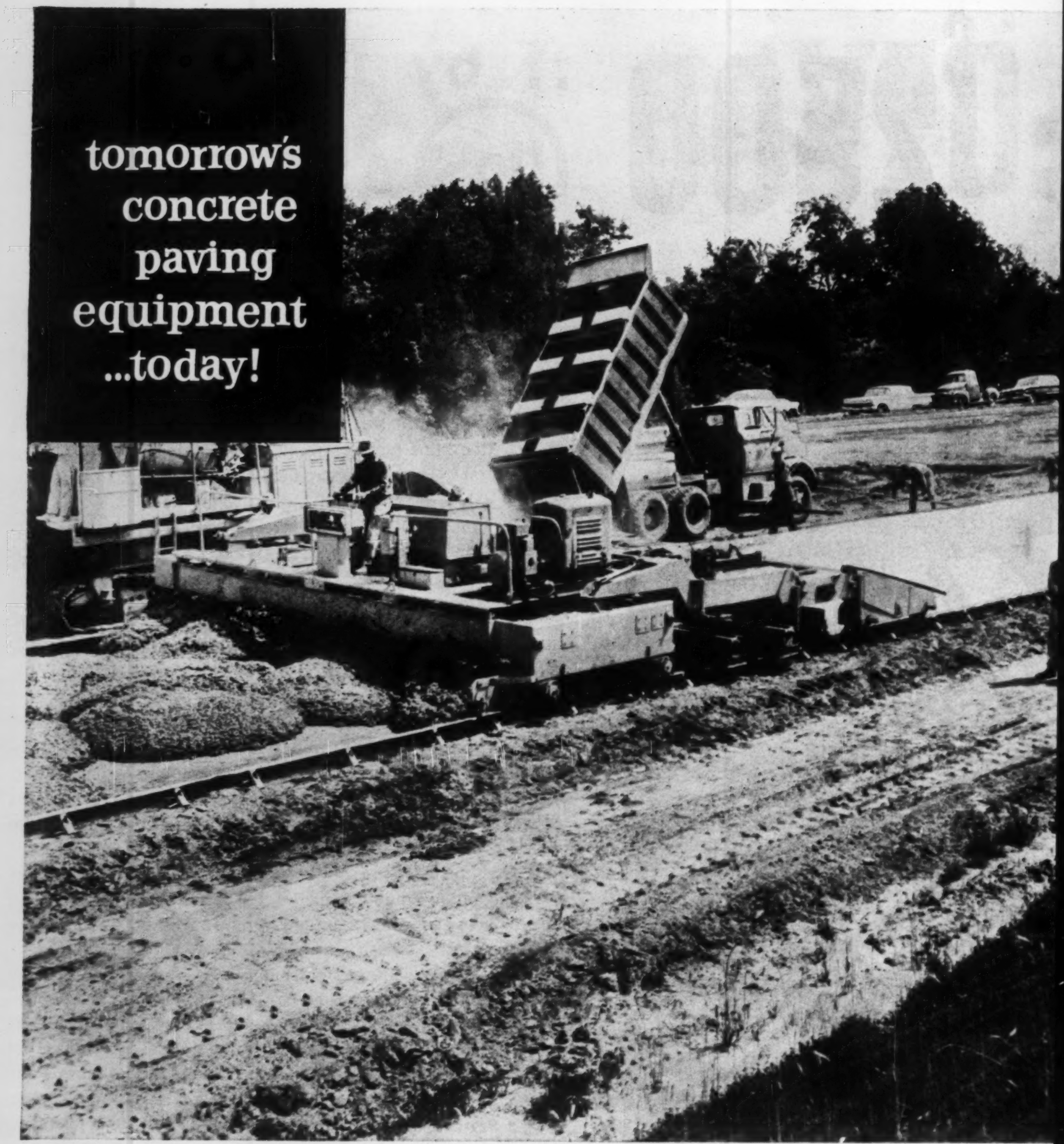
Investigate the advantages of designing with A36 structural steel. Its higher strength can save you money. Delivery is no problem with the complete range of USS Structural Steels available. Contact your local Steel Service Center, United States Steel's District Sales Offices, or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

United States Steel Corporation · Columbia-Geneva Steel Division · Tennessee Coal and Iron Division · United States Steel Supply Division · United States Steel Export Company

USS United States Steel

TRADEMARK

Owner: Mallory Controls Company, Frankfort, Indiana **Architect:** L. C. Kingscott & Associates, Kalamazoo, Michigan, Indianapolis, Indiana, and Davenport, Iowa **Contractor:** Arthur A. Gill & Son, Frankfort, Indiana **Steel Fabricators:** The Berger Steel Company, Inc., Lafayette, Indiana (joists), Hugh J. Baker & Company, Indianapolis, Indiana (columns and beams)



The new REX-O-MATIC working on a paving job on Highway 70, East of Jackson, Tennessee. Ernest Onks, Vice President of Clinchfield Concrete and Construction Company said, "I personally look at any machine from the production standpoint. If it performs quality work to meet with the engineer's approval more economically than on previous experience, I am pleased. *To date this machine is easily meeting these requirements.*"

One tri-batch and two dual drum pavers supply concrete to the REX-O-MATIC—the single-pass machine is performing at the *rate of 12½ ft. per minute* on this 24′ wide, 10″ thick interstate highway.

REX...builds the complete, modern concrete paving line!

- **REX 34-E pavers**
- **REX steel road and airport form**
- **REX spreaders, power widening spreaders**
- **REX finishers, bridge finishers**
- **REX combination finisher-floats**
- **REX curing machines. Also sub-grade planers, testers.**

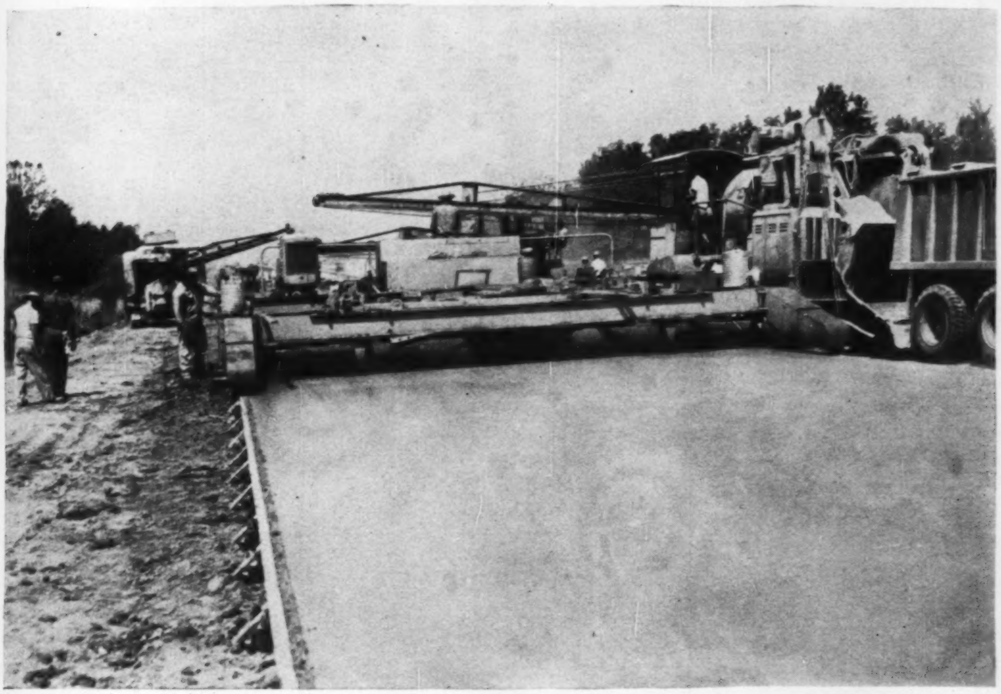
NEW REX-O-MATIC

SPREADS...FINISHES...FLOATS

the ONE machine that does all three!

- **ONE MACHINE**—No long paving train
- **ONE MACHINE**—Jobs of all sizes
- **ONE MACHINE**—
  Produces specified surface tolerances
- **ONE MACHINE**—
  One operator controls all operations
- **ONE MACHINE**—One power source
  operates all functions
- **ONE MACHINE**—
  Paves 12-ft. and 24-ft. widths
- **ONE MACHINE**—
  Disassembles—easy lift and travel
- **ONE MACHINE**—
  Paves roadway with integral curbs
- **ONE MACHINE**—
  For two-course paving job

more concrete paving at lower costs



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CHAIN Belt Company, 4633 W. Greenfield Ave., Milwaukee 1, Wisconsin. In Canada: REX Chainbelt (Canada) Ltd., 1181 Sheppard Avenue East, Willowdale, Ontario.

REX®
CONSTRUCTION MACHINERY

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS—BA

▲ **R. I., Warwick** — BA 11/8 — School Bldg. Comm., School Admin. Bldg., 1849 Warwick Ave., SENIOR HIGH SCHOOL. $2,950,000. Plans deposit $150. Castellucci & Galli & Planka, 75 Empire St., Providence, archts. CD 4/13/61.

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Comr., 170 Douglas St., Hartford, ROAD,

Oneglia & Gervasini, Inc., Casson Ave., Torrington, Conn., CA **$5,335,381**, Projs. 63-171, 63-166 and 159-92, 13.853 lin. ft. grading, paving, incl. 6 bridge structures on Interstate Rte. 91 and Rte. US 5, Hartford and Wethersfield. BA 8/28/61. CD 9/3/61, under LB.

BUILDINGS—LB & CA

▲ **Perini Corp.**, 73 Mt. Wayte Ave., Framingham, Mass., CA est. **$7,000,000**, SHOPPING CENTER, Rte. 9, Framington, Line, NATICK, MASS. Owner, c/o Brennan & McLean, 10 High St. Boston, Mass. Larsen, Steffian, Bradley & Hibbard, 711 Boylston St., Boston, Mass., archts.

▲ **Perini Corp.**, 7 Mt. Wayte Ave., Framingham, Mass., CA est. **$4,000,000**, INDUSTRIAL PLANTS, Rte. 9, Framingham Line, NATICK, MASS. Owner, c/o Brennan & McLean, 10 High St., Boston, Mass. Larsen, Steffian, Bradley & Hibbard, 711 Boylston St., Boston, Mass., archts.

▲ **Grande & Son, Inc.**, 175 Maplewood St., Malden, Mass., CA **$3,092,939**, est. $3,500,000, SENIOR HIGH SCHOOL ADDN. WOBURN, MASS. City, City Hall, 10 Common St., Woburn, Mass. BA 9/21. CD 9/28/61, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., New York**—BA 11/28—Bd. Water Supply, 120 Wall St., New York, Zone 5, Proj. W-7, Contr. 500-Tunnel, WATER SUPPLY TUNNEL under Upper New York Bay, Richmond and Manhattan Boros. Total cost $24,200,000. CD 3/9/61.

BUILDINGS—BA

▲ **N. Y., New York**—BA 10/31—New York City Housing Auth., Rm. 312, 299 Broadway, New York, Zone 7, **(1)** fdns. and general constr. **(2)** heating and ventilating **(3)** electrical work **(4)** plumbing, MOTT HAVEN HOUSES, Proj. NY-5-44, E. 144 St., Willis Ave., E. 140 St., Alexander Ave. and 3 Ave., excluding certain areas in northwest portion and southwest portion, Bronx Boro. Plans deposit $75. Extended date. CD 9/19/61.

▲ **N. Y., West New Brighton**—BA 11/14—New York City Housing Auth., 299 Broadway, New York, Zone 7, **(1)** fdns. and general constr. **(2)** heating and ventilating **(3)** electrical work **(4)** plumbing work, RICHMOND TERRACE HOUSES, Proj. No. NY-5-39, Richmond Ter., Westervelt Ave., Cleveland St., Beechwood Ave., Crescent Ave. and Jersey St. with exclusion of certain portions thereof but incl. addnl. area west of Jersey St., Richmond Boro. $6,000,000. Plans deposit $75. Extended date. CD 10/3/61.

▲ **N. J., Englewood**—BA 11/15—Bd. Trustees Englewood Hospital, 350 Englewood Ave. (selected list of bidders), WEST WING HOSPITAL ADDN. $3,500,000. Ferrenz & Taylor, 1451 Broadway, New York, N. Y., archts. Sears & Kopf, 200 Madison Ave., New York 16, N. Y., mech. engrs. Severud, Elstad & Krueger Assoc., 415 Lexington Ave., New York 17, N. Y., struc. engrs. Harry Handwerger, 155 East 42nd St., New York 17, N. Y., elec. engr. CD 7/17/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Vanbro Constr. Corp.**, 1900 South Ave., Castleton Corners, N. Y., CA **$3,141,132**, Nicholas Ave. SEWER from U. S. bulkhead line to Hatfield Pl. and other Sts., Contr. 3, Section L, COMBINED SEWER, Northfield ditch sewer easement from Blackford Ave. to North line of Dixon Ave. across Dixon Ave. to Van Riper St. and other streets, Richmond Boro, NEW YORK. President Richmond Boro, Boro Hall, St. George, N. Y. BA 9/1. CD 9/6/61, under LB.

▲ **General Railway Signal Co.**, 230 Park Ave., New York 17, N. Y., LB **$4,959,630**, Section 1, LB **$6,269,610** Section 2, LB **$11,090,960** combined (2 bidders), furnishing, installing modern BLOCK SIGNAL and INTERLOCKING SYS. for Broadway-7th Ave. Line, IRT-Div. Section 1, 96 St. to 157 Sts., Section 2, 157 St. to 242 St. incl. 240 Street Yard, Contr. S-104, Manhattan and Bronx Boros, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. BA 10/16 CD 9/14/61.

▲† **Hunkin-Conkey Constr. Co.**, 1740 E. 12th St., Cleveland, O., CA **$14,791,148**, Allegheny Reservoir DAM, (Kinzua Dam) combination conc. gravity structures and rolled earth fill embankments, spillway, stilling basin, eight sluice conduits, prestressed conc. service bridge, rolled earth fill, tainter gates, access roads and parking areas, allegheny Reservoir, Allegheny River, Warren County, approx. 9 mi. above Warren, ENG_36-058-62-3, PENNSYLVANIA. U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa. CD 10/6/61, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 10/13, ROADS,

Pa.—**Bero Constr. Corp.**, Box 70, Waterloo, N. Y., LB **$3,874,381**, (5 bidders), 38,313 ft. constr. divided hy., reinforced cement conc. pavement 24 ft. each side, 8 bridges, L. R. 799(2) Interstate 81, Antrim-Guliford Twps., Franklin Co.,

Pa.—**James D. Morrissey, Inc.**, 9119 Frankford Ave., Phila. 14, Pa. LB **$3,398,689**, (9 bidders), 35,115 ft. constr. divided hy. consist. reinforced cement conc. pavement variable in width, 8 bridges, T. R. U. S. 209, Hamilton Twp., Monroe Co.,

Pa.—**New Enterprise Stone & Lime Co. Inc.**, NEW Enterprise, Pa., LB **$1,883,209**, (5 bidders), 12,682 ft. constr. conc. pavement 25 ft. wide, 1 bridge, L. R. 55(8-15) 732(4), 3 Twps., Huntington & Blair Counties. CD 9/14/61.

BUILDINGS—LB & CA

▲ **Hendrickson Bros., Inc.**, 63 No. Central Ave., Valley Stream, N. Y., CA SUBSTRUCTURE, Unit No. 2, 185,000 KW Generating Unit at existing plant, E. F. Barret Power Station, ISLAND PARK, N. Y. Long Island Lighting Co., 250 Old Country Rd., Mineola, N. Y. CA 10/10. CD 3/6/61.

▲ **Frouge Constr. Co., Inc.**, 141 North Ave., Bridgeport, Conn., Owner Builds, **$6,000,000**, OFFICE, Madison Ave. and East 58 St., NEW YORK, N. Y. CD 8/24/61.

▲ **Psaty & Fuhrman, Inc.**, 369 Lexington Ave., New York 17, N. Y., CA Est. **$5,800,000**, 25 story, 60x280 ft. River View Towers APARTMENTS, 626 Riverside Dr., W. 139, W. 140 Sts., NEW YORK, N. Y. River View Towers, Inc., c/o Kelly & Gruzen, archts., 10 Columbus Circle, New York 19, N. Y., Herman Scherr, 11 Park Pl., New York 7, N. Y., mech. engr. Abrahams Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., struct. engrs.

▲ **M. S. Kelliher Co.**, 10 Trenton St., Boston, Mass., CA **$2,954,000**, 10 story, 55x110 ft. two CO-EDUCATIONAL DORMITORIES. River Campus, ROCHESTER, N. Y. University of Rochester, River Rd., Rochester, N. Y. CD 5/5/61.

▲ **Penn Square Homes, Inc.**, Makefield Rd., Morrisville, Pa., Owner Builds, **$3,700,000**, RESIDENTIAL DEVELOPMENT (375) Makefield Rd., FALLSINGTON, PA. Lester Weckesser, 16 Montana Ave., Erlton, Pa., archt.

▲ **Cafritz Constr. Co.**, 1625 Eye St. N.W., Wash., D. C., CA **$7,000,000**, 12 story OFFICE, 1827 Connecticut Ave. N.W., WASH., D. C. Universal North, Inc., 1625 Eye St. N.W., Wash., D. C. Edwin Weihe & Assocs., 810 18th St. N.W., Wash., D. C., archt.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **Standard Constr. Co., Inc.**, 1000 Connecticut Ave. N.W., Wash., D. C., CA est. **$14,000,000**, 14 story, 156 units APARTMENT, 132 UNDERGROUND PARKING SPACES, 300 block west Franklin, RICHMOND, VA. Kaplan & Magazine, 1000 Connecticut Ave., N.W., Wash., D. C. CD 10/20/61.

▲ **Houston Contg. Co.**, 2807 Buffalo Speedway, Houston, Tex., CA Est. **$3,150,000**, 35 mi. 30 in. and 21 mi. 26 in. GAS LOOP LINES, TENNESSEE, MISSISSIPPI, ARKANSAS, and LOUISIANA. Texas Gas Transmission Corp., 416 West 3rd St., Owensboro, Ky. CD 2/26/59.

BUILDINGS—LB & CA

▲ **Thompson & Street Co.**, 2622 Piedmont Rd., NE, Atlanta, Ga., LB **$3,829,000**, AGRICULTURAL-ATHLETIC COLISEUM, University of Georgia, ATHENS, GA. Bd. Regents, University System of Georgia, 244 Washington St., SW, Atlanta, Ga. BA 10/11/61. CD 9/6/61.

MIDDLE WEST

BUILDINGS—BA

▲ **Ill., Skokie**—BA 11/1—Skokie Valley Community Hospital, c/o Schmidt Garden & Erikson, archts., 104 S. Michigan Ave., Chicago, Zone 3, 152-bed HOSPITAL. $4,500,000. CD 8/7/58.

▲ **O., Mansfield**—BA 11/1—Bd. Educ., 75 Carpenter Rd., SOUTH HIGH SCHOOL. $3,000,000. Plans deposit $70, comb.; $50, general; $25, mechanical; $25, electrical contracts. Bellman, Gillett & Richards, 1600 Madison Ave., Toledo, Zone 2, archts. CD 4/11/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Santucci Constr. Co.**, Skokie, Ill., LB **$3,307,295**, (6 bidders), Contr. 2, 15,700 lin. ft. 8 ft. 6 in. SEWER, in tunnel, Rouge Valley Sewerage Disposal Sys., DETROIT, MICH. Wayne County Rd. Comn., Dpt. P. Wks., 1322 City-County Bldg., Detroit 26, Mich. BA 10/17. CD 9/26/61.

S. A. Healy & Gargaro Co., 6561 E. 7 Mile Rd., and 40 E. 7 Mile Rd., Detroit, Mich., LB **$3,019,965**, (6 bidders), Contr. 3, 16,600 lin. ft. 8 ft. 6 in. SEWERS, in tunnel, Rouge Valley Sewerage Disposal Sys. (Detroit, Mich.).

▲ **Northeast Constr. Co.**, 16099 Common Rd., Roseville, Mich., CA **$1,034,631**, Proj. NS-4, 5,371 lin. ft. DRAINS, 12 ft. 0 in. to 10 ft. 6 in., open-cut and tunnel chambers, jct. boxes, manholes, Birmingham, Troy, Clawson, Royal Oak, PONTIAC, MICH. Twelve Town Drains, 4th Floor, Bd. Supervs. Office, Oakland County Bldg., 1 Lafayette St., Pontiac, Mich. Grand total $8 727,341. BA 9/22. CA 10/2. CD 9/27/61, under LB;

Mancini Constr. Co., 23170 Schoenherr Rd., Warren, Mich., CA **$1,785,955**, Proj. MS-2, 10,020 lin. ft. 11 ft. 0 in. to 7 ft. 6 in. rein.-con. DRAIN, tunnel, jct. boxes, manholes structures, Berkeley, Madison Heights, Royal Oak, Huntington Woods, (Pontiac, Mich.);

Sinacola Constr. Co., Inc., P.O. Box 8, N.E., Livonia, Mich., CA **$696,043**, Proj. MS-5, 7,794 lin. ft. 9 ft. 0 in. to 6 ft. 0 in. rein.-con. DRAIN, open cut, jct. boxes, manholes, structures, Berkley, Madison Heights, Royal Oak, Huntington Woods (Pontiac, Mich.);

C. J. Rogers, J. A. Healy, Gargaro, Barton-Malow Co., 6567 E. 7-Mile Rd., Detroit, Mich., CA **$2,049,834**, Proj. SS-2, 5,667 lin. ft. 14 ft. 3 in. x 13 ft. 3 in. rein.-con. double box DRAIN, 2,268 lin. ft. 6 ft. 0 in. rein.-con. pipe, manholes, jct. boxes, Hazel Park, Oak Park, Ferndale, Southfield (Pontiac, Mich.);

Rocco Ferrera Constr. Co., P.O. Box 4826, Redford Sta., Detroit 19, Mich., CA **$3,160,878**, Proj. SS-6, 17,402 lin. ft. DRAINS, 12 ft. 0 in. to 4 ft. 0 in., tunnel, open-cut, chambers, jct. boxes, manholes, Hazel Park, Oak Park, Ferndale, Southfield, (Pontiac, Mich.).

▲ **Paschen Contractors, Inc.**, 2739 N. Elston St., Chicago, Ill., CA **$6,637,000**, PUMPING CHEMICAL and ADMINISTRATION BLDG., Central District Filtration Plant, CHICAGO, ILL. City, City Hall, Chicago, Ill. BA 9/20/61. CD 9/29/61, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Missouri**—BA About 12/1—National Park Service, Dpt. Interior, Jefferson National Expansion Memorial, 11 N. 4 St., St. Louis, Zone 2, 630 ft. GATEWAY ARCH for Jefferson Expansion Memorial on river front between Eads Bridge and Poplar St. incl. VISITOR CENTER at its base, St. Louis. $10,000,000. Eero Saarinen & Assocs., Bloomfield Hills, Mich. and 1300 Woodward St., Birmingham, Mich., archts. CD 10/2/61.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., San Francisco**—BA 11/9—City and San Francisco Co., P. Utility Comn., City Hall, Proj. HH-WS 349, Canyon Power TUNNEL and related work, Stanislaus National Forest and Yosemite National Park, Tuolumne Co. $15,000,000. Plans deposit $25. Sverdrup, Parcel & Assoc., Inc., 417 Montgomery St., archts.-engrs. CD 11/11/55.

BUILDINGS—BA

▲ **Wash., Fort Lewis**—BA 11/21—U. S. Eng., 1519 S. Alaskan Way, Seattle, Zone 4, 500 units, frame Capehart FAMILY HOUSING, ENG-62-5. $7,818,057. Plans deposit $10. Jonas, Lovegren, Helms & Jones, Washington Bldg., Seattle, archts. CD 10/11/61, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, ROAD,

Gordon H. Ball, Gordon H. Ball, Inc., and **Talbot D. Bailey, Inc.**, 300 Camille Ave., Danville, Calif., CA **$4,522,222**, 2.1 mi. four lane freeway US Hy. 101, Santa Barbara Co. BA 9/27. CD 10/2/61, under LB.

BUILDINGS—LB & CA

▲ **Merco Constr. Co.**, 6052 Venice Blvd., Los Angeles, Calif., LB **$2,951,854**, est. $2,885,000, (6 bidders), Mulholland JUNIOR HIGH SCHOOL (formerly Birmingham Junior High School), Van Nuys, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Deasy & Bolling 8810 Melrose Ave., Los Angeles, Calif., archts. BA 10/13. CD 9/21/61.

CANADA

BUILDINGS—BA

▲ **Ont., Cooksville**—BA 11/2—South Peel Hospital, Upper Middle Rd., 5th and 6th floor HOSPITAL ADDN. $5,696,000. Plans deposit $250. Extended date. Chester C. Woods, 2842 Bloor St. W., Toronto, archt. Ralph C. Manning & Assocs., 745 Mount Pleasant Rd., Toronto, engrs. CD 10/2/61.

BUILDINGS—LB & CA

▲ **Western Gypsum Ltd.**, 306 Electric Railway Chambers, 213 Notre Dame Ave., Winnipeg, Man., Owner Builds, **$3,000,000**, INDUSTRIAL PLANT, incl. office, warehouse, production plant and mill, CLARKSON, ONT.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Utah Constr. & Mining Co.**, 550 California St., San Francisco, Calif., U.S.A., and **Brown & Root**, Sudamericaine (Brown & Root, Inc., 4100 Clinton Dr., Houston, Tex., U.S.A.), CA Est. **$47,000,000** (11 bidders), 15 mi. TUNNEL, DAM and section 2nd TUNNEL for Eucumbene-Snowy Tunnel, AUSTRALIA. Snowy Mountains Hydro-Electric Auth., P.O. Box 322, Cooma North, New South Wales, Australia. BA 8/21. CD 4/28/61.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Saudi Arabia**—BA 11/9—Saudi Arabian Govt., Water Projects Comn., Dammam Municipality, Dammam, WATER and SEWAGE PROJECTS. $8,500,000. Plans deposit $100. CD 7/26/57.

For additional reports see CONSTRUCTION DAILY, REPORTS SECTION

(Proposal Advertisements see pp. 89 to 91)

48-ton "hot rods" won't damage this road!
It's made with USS Blast Furnace Slag

Here's an all-slag road that gets tough punishment all year, yet it's still as good as new. The road is used for hauling red-hot steel slabs from one mill to another at the Gary Works of United States Steel. When loaded, each of the four-wheeled straddle buggies used weighs 48 tons, and they run a total of 100,000 trips per year. The steel slabs carried are so hot (1800°F) the buggies can't stop, because the tires will burn, but the road shows no sign of wear. Even quick thawing and refreezing during the winters has caused no damage.

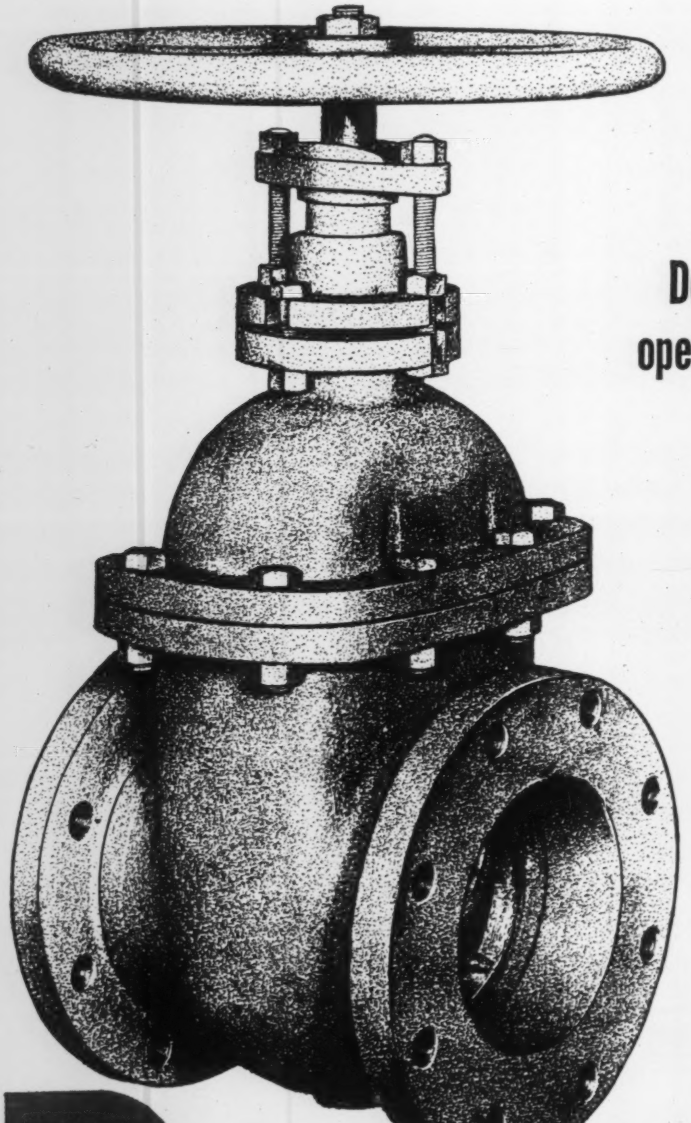
When the road was constructed, eight inches of reinforced slag concrete pavement (portland slag cement, sand and crushed slag aggregate) were laid over a base course of three inches of crusher-run slag and four inches of compacted granulated slag subbase.

USS Blast Furnace Slag is the all-purpose road-building aggregate. In addition to being hard, tough and stable, it is angular in shape and has many rough "pocketed" surfaces which provide a tight bond with bitumen in black-top mixtures, and with cement mortar in concrete. Slag aggregate improves pavement skid-resistance; and compared with other aggregates weighing up to 50% more per cubic yard, slag yields more paved surface per ton.

Granulated slag, moreover, provides added support and drainage when used as subbase under flexible or rigid pavement; and mixed sizes of air-cooled slag are extensively used for stabilizing roadway shoulders. Specify USS Blast Furnace Slag on your next road project. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS United States Steel

TRADEMARK



Dependable Darling Gate Valves open fully, close tight—with ease

The fully revolving double disc parallel seat and wedge design minimizes friction, avoids concentration of wear, and automatically compensates for valve seat deflection.

Gate discs are independently hung and free to revolve. They change their seating position at each closing. All working parts are perfectly plain. There are no pockets to collect sediment or prevent free and easy movement.

For assured ease of operation, minimum maintenance, long trouble-free service life, *you can depend on Darling*. Our engineers are always glad to assist you in determining the right valves for your service conditions. Darling Catalog No. 57 gives complete specifications. Write for your copy today.

DARLING VALVE & MANUFACTURING CO.
Williamsport 34, Pa.
Sandilands Valve Manufacturing Co., Ltd., Galt 19, Ontario, Canada
Vannes Darling-France, 23 rue du Commandant Mouchotte, St. Mandé, France

YOU CAN DEPEND ON

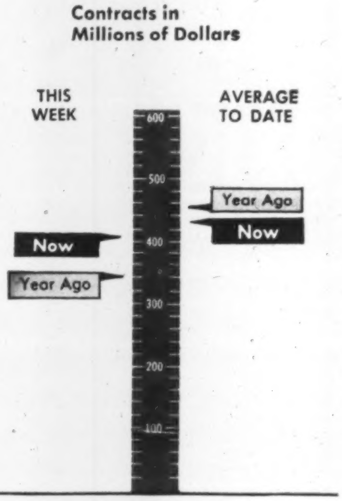
Darling

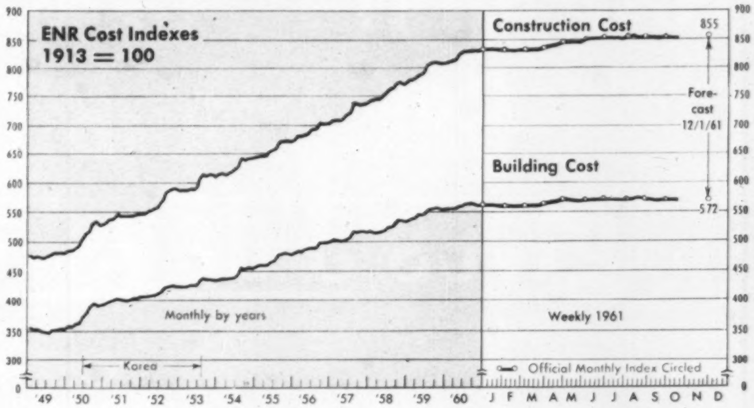
TRADE
DARLING
MARK

GATE • BUTTERFLY • CHECK • SPECIAL VALVES • FIRE HYDRANTS

Construction Scoreboard

This Week . . .





AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week millions	Cum. 43 wks 1961 millions	Cum. 43 wks Chge '60-'61 %
All Heavy Construction	$417.1	$18,559.0	— 2
By Ownership			
PRIVATE	166.4	9,135.6	—10
PUBLIC	250.7	9,423.4	+ 7
State & Municipal	203.6	7,393.0	+ 7
Federal	47.1	2,030.4	+ 5
By Type of Work			
PUBLIC			
Waterworks	16.9	333.3	—14
Sewerage	48.4	682.2	+41
Bridges*	4.4	551.3	—19
Highways	64.7	3,169.3	+12
Earthwork, Dams & Waterways	30.6	684.3	+ 5
Buildings:			
Excl. Housing	66.6	2,239.7	+11
Housing	9.6	695.5	+24
Unclassified	9.5	1,068.5	—12
PRIVATE			
Buildings:			
Mass Housing	79.3	4.233.6	—11
Commercial	52.4	2.158.0	+ 5
Industrial	28.6	2.360.9	+ 2
Unclassified	6.1	382.4	—60

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Oct. 19 millions	Cum. 42 wks 1961 millions	Cum. 42 wks Chge '60-'61 %
Corporate Securities	$123.8	$2.823.9	0
State & Municipal:			
All Except Housing	112.4	5.385.4	+ 1
Housing	0.8	101.4	—46
Federal Loans	0	197.4	+2[illegible]
Federal Aid	0	3.463.6	+ 7
Total Nonfederal	$237.0	$11.971.7	+ 2
Federal Appropriations:			
Projects in U. S.	0	3.132.4	— 1
Outside U. S.	0	90.0	—43
Total New Capital	$237.0	$15.194.0	+ 1

ENR INDEXES (1913 = 100), 20-cities average	Week of Oct. 19 1961	% Change from Sept. 21 1961	% Change from Oct. 20 1960
Construction Cost	853.80	+0.1	+3.0
Building Cost	570.01	—0.4	+1.6

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	September 1961 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$125,849	—0.2	+1.7
By Ownership—			
Private	58,178	+0.5	+4.3
State & Municipal	54,029	—0.3	+1.0
Federal	13,642	+0.6	—5.9
By Type of Work—			
Waterworks	3,111	—0.3	+8.5
Sewerage	4,334	+1.0	+9.5
Bridges	3,127	—0.9	—5.0
Highways	12,931	—1.2	—5.3
Earthwork, Dams and Waterways	11,939	—0.1	—0.6
Public Buildings	22,610	+1.8	+1.5
Industrial Buildings	18,161	+0.1	+0.02
Commercial Buildings	29,201	+1.0	+8.8
Unclassified, Private	10,816*	—0.1	+0.5
Unclassified, Public	9,619	—0.1	—2.8

* Includes Private Bridges, $98 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

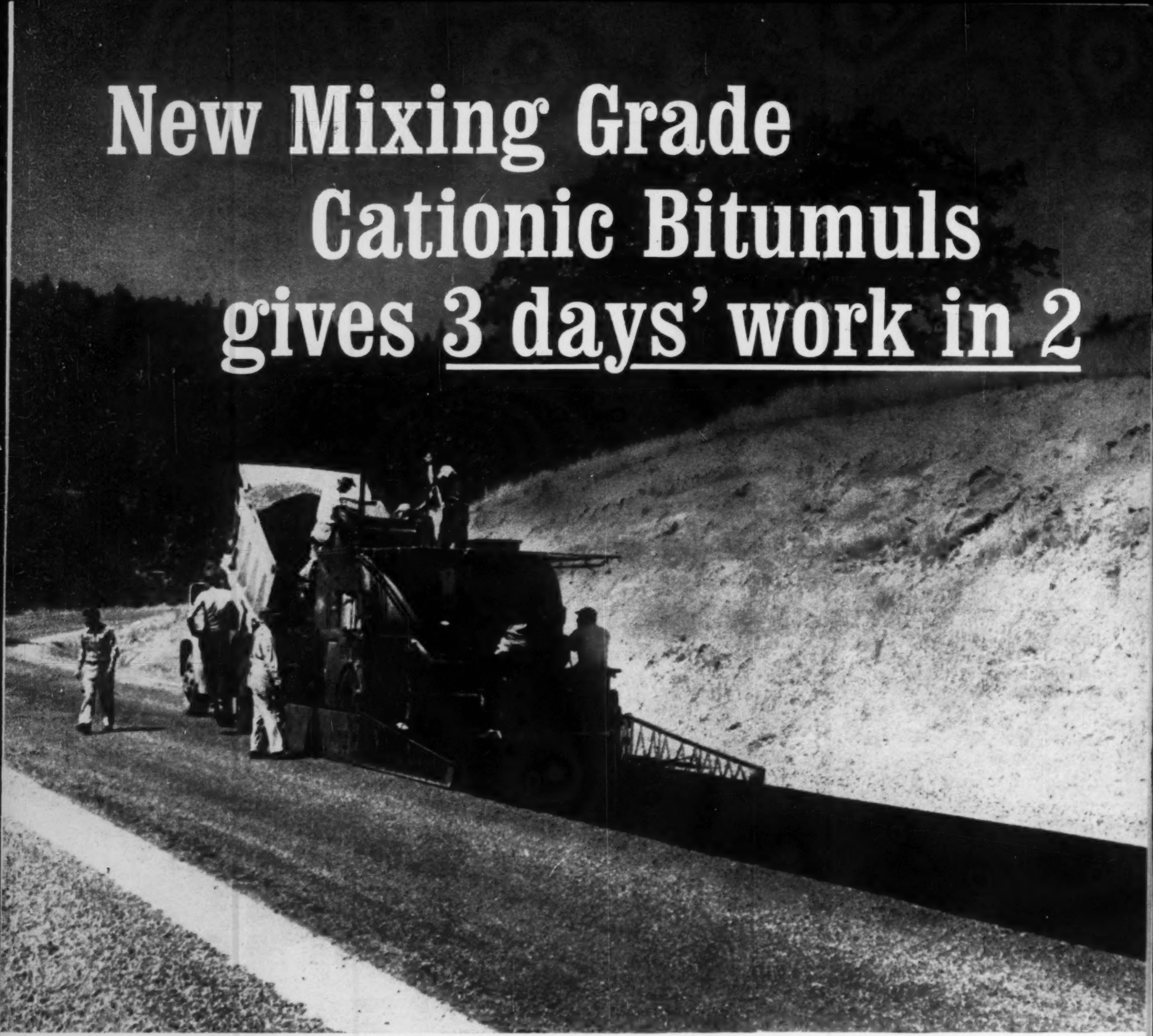
	1961 Sept. (millions)	1961 9-months (millions)	Percent Change from 1960 Sept.	Percent Change from 1960 9-Mos.
Total U. S. (ENR reported)	$1,444	$15,660	—11	—10
By Ownership—				
Private	797	9,304	+ 6	— 5
State & Municipal	475	5,751	— 5	— 5
Federal	172	605	—54	—61
By Type of Work—				
Waterworks	22	524	+ 6	+92
Sewerage	96	695	+61	+37
Bridges	8	190	—69	+ 1
Highways	26	922	—84	—53
Earthwork, Dams and Waterways	28	372	—87	— 6
Public Buildings	403	3,191	+42	— 3
Industrial Buildings	166	2,875	— 7	+ 3
Commercial: Mass Housing	341	3,023	+32	—25
Other Building	256	2,707	+ 0.2	+20
Unclassified, Private	34	699**	—41	—97
Unclassified, Public	64	462	—42	—54

** Includes Private Bridges, $0.5 million.

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

	1961 Sept.	1961 9-months	Sept.	9-Mos.
Total U. S. (ENR reported)	852	8,577	—18	+ 1
By Ownership—				
Private	292	3,123	—22	— 6
State & Municipal	476	4,191	—16	+10
Federal	84	1,263	—14	— 3

New Mixing Grade Cationic Bitumuls gives 3 days' work in 2



Rich, black Cationic Bitumuls mix laid down in 10′ (half-width) panel.

Check this profit-making arithmetic! When you use new Mixing Grades Cationic Bitumuls—even with fine-graded aggregates—you get:

Easier Mixing
+ Faster Curing
3 Days' work in 2

That's been the story in Douglas County, Oregon, where their Forces used this binder with crushed, pit-run gravel in a Moto-Paver to surface a 2.5 mile section of new road construction. This saving of time, of course, means important reduction in cost.

Because it strongly out-performed the highly-treated RC-3 cutback previously used, Mixing Grades Cationic Bitumuls is now used extensively for Moto-Paver work in Douglas County, with pre-tested aggregates.

Fast mixing with Cationic Bitumuls (nearly 50% more than earlier production with cutback) kept aggregate trucks on the go.

Job Report — Mixing Grade Cationic Bitumuls

Location: Looking Glass Road, Douglas County, Ore.
Type of Work: Moto-Paver 2" surfacing on new road.
Engineers and Titles: Mr. Al May, County Engineer; Mr. Harry Morrill, Assistant County Engineer.
Date: July 10, 1961.
Specifications: Size specifications of crushed, pit-run gravel (¾"-0) only specification involved.
Work Done By: County Forces.

Crushed, pit-run, graded Umpqua River Gravel (100% passing ¾"; 38% passing #4; 28% passing #10; 3% passing #200) was selected as aggregate for surfacing. Laboratory tests on this aggregate determined the proper grade of Cationic Bitumuls.

(Note: With earlier Cationic emulsions the aggregate had to be screened and graded, with minimum size about ¼").

Mixing and placing were done in the usual way; but the Moto-Paver crew estimated through-put at **nearly 50% more** than the production with the RC-3 treated cutback. Reason: easier mixing and handling of the Cationic Bitumuls and the resultant mix.

Also, the crew reported a much more rapid cure of the Cationic Bitumuls mix as compared to the cutback mix. This permitted the roller to compact the in-place mix very close behind the paver.

Job Procedure: The crew on the Moto-Paver place a 10' lane on one side of the road to the full length of one day's production. Next day they paved an adjacent 10' lane to complete the 20' surface width.

To get traffic through the job, vehicles were routed over the day-old Bitumuls surface. This traffic is generally light, but does include some loaded logging trucks. The Cationic Bitumuls surface showed no displacement under wheels. With the old cutback mix, marked displacement had occurred.

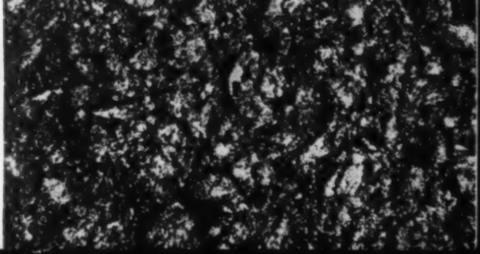
Summary: The Mixing Grade of Cationic Bitumuls handled easier; mixed faster; went down easier; compacted and cured faster; had better early stability; worked better with graded, pit-run aggregate.

These significant benefits are apparent in jobs across the nation where Mixing Grades Cationic Bitumuls are being used on a wide variety of jobs—from Base Construction to Surfacing.

In many instances when job size, job location or other factors make the use of hot plant mixes impractical, you can benefit from this time-saving, money-saving performance of new Mixing Grades Cationic Bitumuls on either new road construction or maintenance work. Call our nearest office for full information.

Rapid cure of Cationic Bitumuls mix let roller work closer behind the paver.

A good, rich mix with excellent coating—faster mixing with Cationic Bitumuls actually improved quality of finished material.



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Inglewood, Calif.
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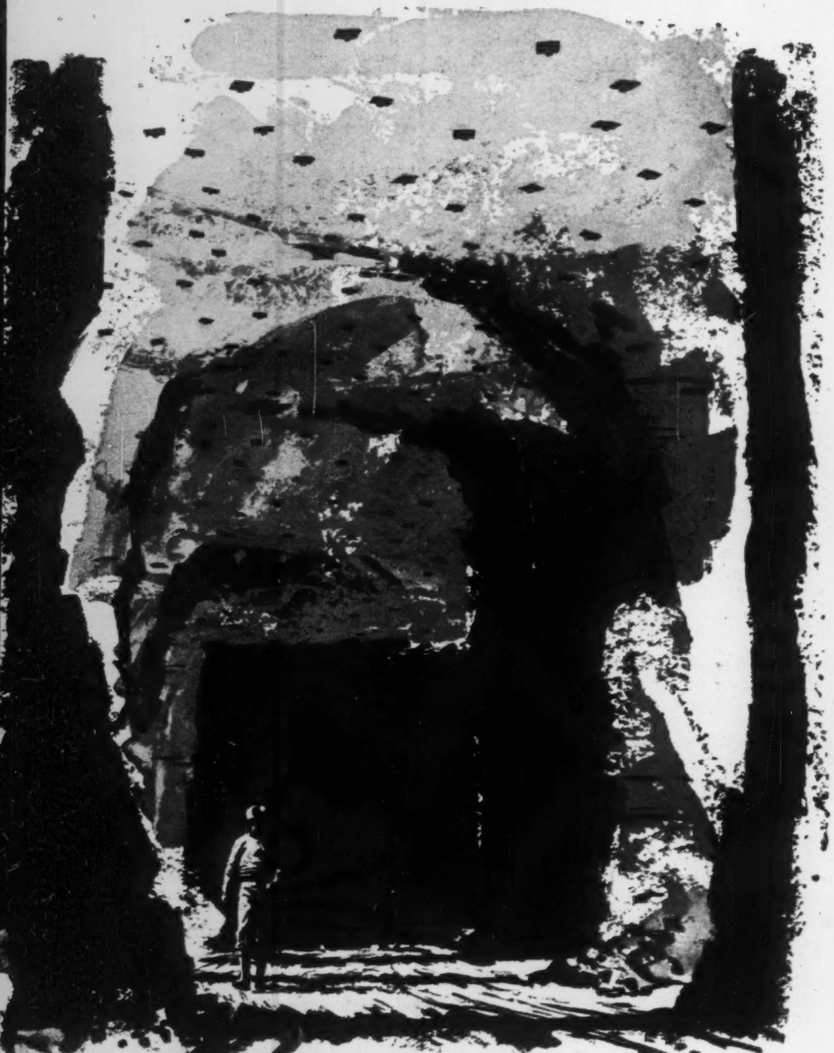
GOING UNDERGROUND TO STORE LPG?

Minimize rock falls with Bethlehem roof bolts.



There's no need to worry about roof stabilization in underground storage areas. Most roof problems can be solved by the installation of Bethlehem roof bolts. Thoroughly proved in mines and tunnels, bolting minimizes rock falls by clamping strata together to create a stable roof.

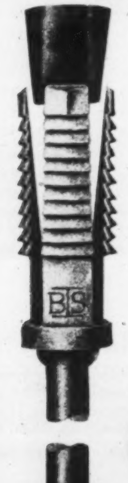
Bolts are easy to install

The first step is to survey the strata to determine the best bolting pattern. Next the holes are drilled. Then roof bolts, in predetermined lengths and diameters, are installed to proper torque for local conditions.

Our bolting experts are at your service

To help you get your men started, Bethlehem roof-bolt engineers will show you how to test, and give you some pointers on installation procedure. Feel free to ask for their help without obligation.

Want more information? Just phone the nearest Bethlehem sales office. Or write to us at Bethlehem, Pa.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

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for Strength
... Economy
... Versatility

Work Worth $1.2 Billion on Ballot

Total construction-financing propositions down 65% from last year's record volume of $3.4 billion

The nation's voters will be faced with $1.2 billion worth of state and local government financing proposals when they go to the polls on election day, November 7.

Postponement of a $916-million bond proposal to finance construction of a rapid transit system for the San Francisco Bay Area helped cut this year's proposition total to the lowest point since 1957 when only $764 million in construction propositions went to a vote.

This year's proposal volume drops sharply below that of last year. Then, $3.4 billion worth of construction-financing issues showed on ballots and voting machines. Of the total, voters approved $3.18 billion worth, for an approval rate of 94%.

Largest volume of proposals will appear in New York State, $650 million worth.

The proposals involve amendments to the state's constitution. One would allow the legislature to guarantee $500 million worth of bonds or notes to finance construction of dormitories and other improvements at any college or university in the state, public or private. A new agency, the New York State College Buildings Authority, would issue the obligations.

Another amendment would permit the legislature to guarantee debt of the Port of New York Authority up to a limit of $100 million on bonds maturing in no more than 35 years. Such borrowings would go for purchase of railroad passenger equipment, which would be leased to commuter railroads in that part of the Port of New York located within New York State. (The Port of New York Authority, a bi-state agency, also has jurisdiction within New Jersey.)

The third amendment would authorize municipal financing of industry. The state would be liable for $50 million worth of public corporation bonds to finance construction or improvement of manufacturing plants. The program, if approved, would be administered by a new State Job Development Authority. Establishment of this body is contingent on voter approval of the $50-million bond guarantee.

New Jersey voters will act on statewide proposals totaling $100 million; $40 million for construction of state institutions and $60 million for land acquisition, recreation and reservoirs.

In North Carolina, $61.7 million in bond issues is proposed to finance various capital improvements.

Other major bond proposals include:

- San Francisco, $119.3 million, of which $115 million would go for improvement and expansion of the municipal water system.
- Philadelphia, $65 million, various purposes.
- Cleveland, $19 million, various purposes.
- Cincinnati, $12.8 million, various purposes.
- Youngstown, $9 million, streets.
- Lorain, $5.9 million, various purposes.
- Lima, $5 million, various purposes.
- Wilmington, N.C.; $10.4 million; schools, water lines, sewerage treatment, and power transmission lines.
- Danville, Va., $9.4 million; public buildings and institutions, street improvements, gas distribution lines and schools.
- Arlington County, Va., $6.6 million; sewers, roads, sidewalks, schools and other public buildings.

Local economic conditions may help determine the success or failure of the various proposals. Approval rates for bond proposals fluctuated sharply in previous years.

In 1956, when $2.7 billion worth of construction-financing proposals hit the ballot, 90% received approval. The rate fell to 81% in 1957 when only $274 million in proposals was considered. It slipped to 68% of $2.1 billion worth of proposals in 1958, then plunged to 56% in 1959 when proposals totaling $1.02 billion appeared on ballots. But last year when $3.4 billion worth of construction financing went to a vote, the approval rate soared to 94%.

Voters in at least two regions have already approved investment in public facilities.

Last week in Maine, they gave the nod to $8.6 million worth of bond proposals, one of $6 million for highway construction financing, and another of $2.6 million to finance construction of dormitories at state teachers' colleges. In a close vote, they also approved a constitutional amendment that will permit borrowing by municipalities for construction of industrial plants.

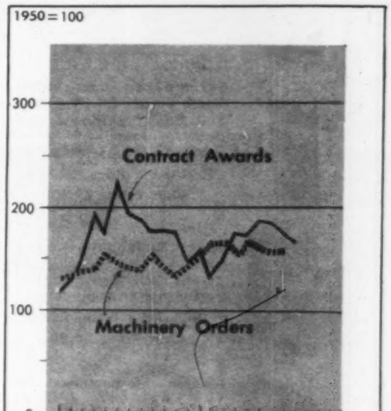
In Georgia's DeKalb County, voters approved bond issues of $22.9 million to finance water and sanitary sewer lines, road improvements and various types of public buildings.

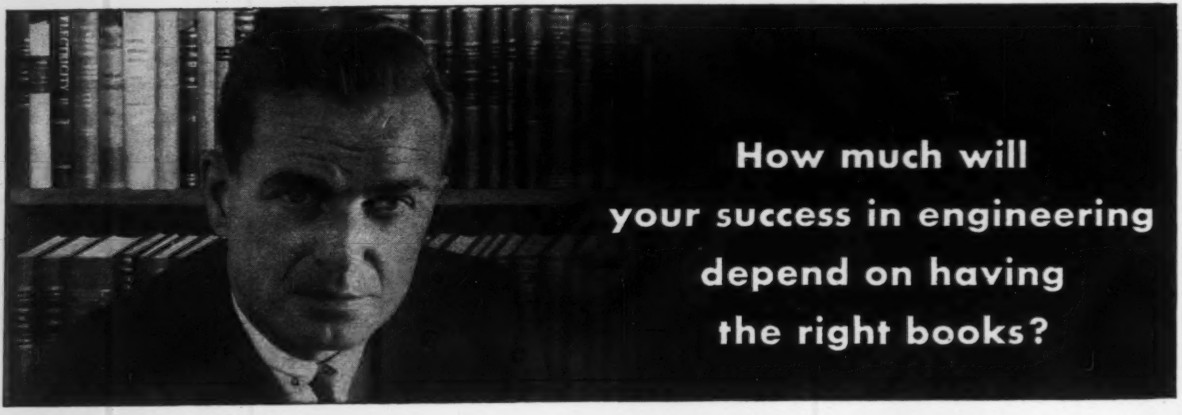
Equipment Orders Rise Slightly

New orders for construction equipment held up in August. The index edged up to 158 from July's 157 (revised from 154). August's value rose 13% above August, 1960, making it the second highest August on record. The McGraw-Hill Economics Department computes this index from reports by cooperating companies.

When the index for September is computed, it may show a rise if manufacturers in general experienced the same dealer-hedge against a strike that Caterpillar Tractor reported. The Peoria-based company said that advance buying in September by dealers in anticipation of a strike helped push its sales in the third quarter and first nine-months above year-earlier levels.

While the mild summer slide in equipment orders halted in August, the construction contract index slipped each month from a June high of 186 to a September value of 161. Both indexes are based on 1950 as 100.





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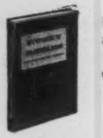

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Committee Issues Davis-Bacon Report

- **Goldberg group urges use of general standards for deciding what missile work is "construction."**
- **The recommendations don't solve the conflict between craft and industrial unions over jurisdiction.**

A Davis-Bacon report on missile work submitted to Labor Secretary Arthur Goldberg last week may increase the pressure for a full-scale congressional review of the prevailing wage law and its administration.

The report came from the Missile Site Public Contract Advisory Committee set up by Mr. Goldberg last April 25. The Committee's task was to come up with a workable standard for determining what work at missile and space vehicle sites is "construction" work on which wages must be paid at the "prevailing" rate.

The Committee concluded that specific standards or criteria—something tried by the Eisenhower Administration —are "not practical." It came up with two general standards that are somewhat reminiscent of the inconclusive and ineffective jurisdictional agreement between the building trades and industrial unions known as the "Miami agreement."

What the Committee has suggested as a "basic and primary guide" is this:

- Missile site work is "construction, alteration and/or repair, including painting and decorating" covered by the law if performed for or incidental to the purpose of:

"Providing housing, shelter, protection, access to, or permanent foundation for a missile or space vehicle, its associated and supporting systems (including components thereof), and for site personnel, or,

"Providing such basic services and facilities (e.g. primary power, heat, illumination, plumbing, air conditioning, et cetera) as are necessary to fully equip and fit out a building or structure (surface or subsurface) in order to meet the requirements for which such building or structure is designed."

- Missile site work is not "construction" work within the law if it "is performed for or is incidental to the purpose of providing a fully operable missile or space vehicle, together with its associated and supporting systems (including components thereof)."

The Committee made it clear that suggested Davis-Bacon standards such as these have nothing to do with—and in no way solve—the problem of jurisdictional conflicts over missile work between craft and industrial unions.

The law, the Committee said, is concerned only with the maintenance of wage levels with respect to work covered by the law. It is immaterial whether the work is performed by a contractor or a manufacturer, by a building tradesman, technician or production worker, the Committee explained, as long as the "prevailing" wage is paid if the work is what the law calls "construction" work.

The building trades unions, however, have always felt that official decisions on Davis-Bacon coverage do play an important role in their jurisdictional conflict with the industrial unions. As a practical matter, every favorable decision gives them more ammunition in pressing their jurisdictional claims within the AFL-CIO.

The Goldberg committee, in settling on the two standards it recommended, specifically rejected four alternative tests or standards for determining what is "construction" work: Past practice, ability to perform the work, relative cost of the work (depending on who performs it) and whether the material or unit on which the work is done is attached to the realty.

These tests, the Committee felt, are too unreliable or unwieldly to be of any practical use. It found that past practice is a "mixed practice" and that it would be a hopelessly time-consuming and complicated test to apply. And the law, it said, is not concerned with comparative skills or costs, or with the distinction between personal property and real estate.

In a general indictment of the Davis-Bacon Act, however, the Committee confessed that no one can tell from the law itself or from its legislative history what Congress intended as to its application. The Committee said there should be "an official clarification of the purpose and impact of the Davis-Bacon Act."

At the same time, the Committee expressed dissatisfaction with the law's administration and said the standards it suggested will be "of little utility" unless the law's administration is streamlined and improved.

The Committee suggested, among other things, that:

- Contracting agencies should determine what items of work the law applies to as well as in advance of the time of work performance as possible.
- The significance of wage determinations and coverage rulings should be clarified.
- More expeditious machinery should be devised for getting coverage rulings, and the machinery should operate at a "high level of responsibility."
- Somewhere along the line there should be someone authorized to determine whether disputes over coverage should be referred to the Missile Sites Labor Commission or to the Federal Mediation and Conciliation Service, or elsewhere.

Davis-Bacon Act Revision Asked

The federal Davis-Bacon Act should be amended to require the payment of prevailing fringe benefits as well as the prevailing hourly wage, according to management and labor leaders in the New York State building industry.

Unanimous agreement on the proposed amendment was reached by the two groups at a labor-management conference held last month at Cornell University. The conference was the most recent one in a series of statewide conferences set up on a continuing basis in 1958 to explore in a friendly atmosphere problems of mutual interest.

The Davis-Bacon proposal if adopted by Congress, would require the inclusion of welfare, pension and similar benefits in prevailing wage determinations applicable to federal construction projects. The proposal has had the active support of the building trades unions for many years. Present law covers basic wages only.

The agenda for this year's conference covered a variety of subjects, ranging from public relations to nonunion and open shop conditions. The consensus of those attending the conference was that each group now has a better understanding of the "other side's story" than ever before.

UA Contractors Push Peace Plan

Several national contractor associations and the plumbers international union (United Association) took a big step in September toward peaceful solution of labor disputes between UA locals and their employers.

Through the Joint Industry Program Committee, they have recommended that all their local unions and local contractor organizations incorporate practical grievance machinery clauses in their labor contracts. A model arbitration clause containing a no-strike provision has been drafted by the committee. JIPC members are circulating the clause at the local level with the recommendation that it be inserted in local labor contracts that now contain no grievance machinery provisions.

JIPC, which serves as a labor-management forum, was organized several years ago to improve industry and labor relations between the participating contractor associations and the UA, and generally to advance the interests of the industry its members serve.

JIPC members, in adition to the UA, include the Mechanical Contractors Association of America, National Association of Plumbing Contractors, Pipe Fabrication Institute, National Automatic Sprinkler and Fire Control Association, National Lead Burning Association, Refrigeration and Air Conditioning Contractors Association, Pipeline Contractors Association and the National Constructors Association.

The model arbitration clause pushed by JIPC calls for a 10-man Joint Arbitration Board equally representing the parties to the local agreement. The Board would have jurisdiction "to conduct bargaining negotiations, settle all disputes and grievances that might arise . . . and carry out the terms" of the agreement.

"All disputes and grievances must be arbitrated," the clause reads, "and the decision of the Board with respect thereto shall be final and binding on all the parties subject to this agreement and there shall be no work stoppage or abandonment of work during such arbitration."

Labor in Brief . . .

- **Still unsettled**—The NLRB hearing on a craft-industrial union jurisdictional dispute over work on an addition to the Goodyear Tire & Rubber Co. research building in Akron, Ohio, has been recessed until November 8 pending strike-free efforts to negotiate a settlement. The local building trades council had picketed to protest performance of "construction work" by skilled workers in the United Rubber Workers Union.

- **Employment off**—Construction employment, while still 34,000 above September 1960, dropped by 62,000 last month and stood at 3,103,000, according to the U.S. Labor Department's September report. The drop, described as "somewhat more than usual," was attributed to bad weather.

- **Moonlighting**—Labor Secretary Arthur Goldberg indicated last week that moonlighting (holding two jobs) is not a serious problem. He said a new Labor Department survey shows that moonlighting is not on the increase, that hours worked on second jobs are generally short and that many moonlight jobs would be "unsuited to the unemployed."

- **Open shop**—The Associated Builders & Contractors, Inc., an open shop trade association, is organizing a new chapter in Philadelphia. ABC now has seven chapters in three states and Washington, D.C. Its corporate predecessor was active in litigation that upset efforts of the Baltimore building trades to curb the open shop.

- **Montreal strike**—A break in the first general strike in Montreal construction came last week, when a dozen contractors formed a new association and signed interim labor contracts with the Building Trades Council and the sheet metal workers union. The strike was called October 10 in support of the sheet metal workers who have been on strike against the Montreal Builders' Exchange for six weeks.

- **Safety**—Spurred to action by the accidental death of 40 construction workers in Michigan last year, a state legislative committee is studying possible changes in the state safety code. Labor Commissioner James A. Bowden said: "We need a stricter state safety code on all levels." Two AGC chapters are opposing changes.

OFFICIAL PROPOSALS

Bids: November 13, 1961

Tyrone Borough Sewer Authority
Tyrone, Pennsylvania

RE-ADVERTISEMENT FOR BIDS

Separate sealed proposals for the construction of the Additions to the Sewage Treatment Plant, 16" C.I. Force Main and 8" C.I. Sludge Force Main near the Borough of Tyrone, Pennsylvania, will be received by the Tyrone Borough Sewer Authority, in the Borough Hall at Tyrone, Blair County, Pennsylvania until 2:00 PM, E.S.T., November 13, 1961, and publicly opened and read aloud.

The work will be divided into four contracts designated as follows:

CONTRACT NO. 6—
GENERAL WORK
CONTRACT NO. 7—
MECHANICAL WORK
CONTRACT NO. 8—
ELECTRICAL WORK
CONTRACT NO. 9—16" C.I. Force Main and 8" C.I. Sludge Force Main

Bidders may bid on any one contract, or more than one contract, but a separate proposal accompanied by a separate check or Bid Bond must be submitted for each contract for which a bid is submitted.

Information for Bidders, Form of Proposal, Specifications and Form of Contract, may be examined at the Office of Lewis L. Gwin, Consulting Engineers, 1200—12th Avenue, Altoona, Pennsylvania, and copies thereof may be obtained upon a deposit of Fifty (50) Dollars for each set of documents for each contract. If the documents are returned in good condition within five (5) days after the opening of bids, the full amount of the deposit for one set will be returned to each actual bidder and other deposits will be refunded with a deduction of $25.00 to defray the actual cost of reproduction. If the documents are not returned within the time stated, the entire amount of the deposit will be forfeited.

A certified check or bid bond drawn to the order of the "Tyrone Borough Sewer Authority" equal to ten (10) percent of the amount of the bid must be submitted with the proposal.

The Proposal must be sealed and marked "SEALED PROPOSAL *FOR CONTRACT NO.* , FOR THE CONSTRUCTION OF ADDITIONS TO THE TYRONE BOROUGH SEWAGE TREATMENT PLANT", addressed to Mr. Charles C. Burley, Secretary of the Tyrone Borough Sewer Authority, and the contract or contracts under which the Proposal is being submitted must also be shown thereon.

The Tyrone Borough Sewer Authority reserves the right to reject any or all bids or waive any informality, and to award each contract to cover the construction of the additions to the Tyrone Sewage Disposal Plant, as mey be deemed by the Tyrone Borough Sewer Authority to be to their best interests.

No bidder may withdraw his bid within sixty (60) days after the actual date of the opening thereof.

CHARLES C. BURLEY, SECRETARY
TYRONE BOROUGH SEWER
AUTHORITY
P. O. BOX 28, TYRONE, PA.
Dated: October 16, 1961

U. S. Government

U. S. Department of the Interior, Office of Saline Water, sealed bids (Specifications No. 224) will be received at Washington, D. C., until 3:00 p.m. Eastern Standard Time, the 5th day of December 1961, for construction of a forced circulation vapor compression distillation brackish water conversion plant to be constructed at Roswell, New Mexico. Lump sum bid shall include 1. one (1) 1,000,000 gallon per day forced circulation vapor compression distillation brackish water conversion plant with building auxiliaries and accessories all complete in accordance with the specifications and erected on the site. The plant shall be completed by 365 calendar days from the date of the Notice to Proceed: and 2. A firm bid to cover start-up cost during seventy-five (75) day test period. For particulars, address: U. S. Department of the Interior, Office of Saline Water, Washington 25, D. C., Mr. Charles F. MacGowan, Director.

OFFICIAL PROPOSALS

RATE: **The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

CLOSING DATE: **Friday 10:30 A.M. for issue dated the following Thursday.**

SEND COPY TO: **Official Proposal Division,**
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: November 16, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Canal Law and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 16th day of November 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. Fuller, District Engineer, 353 Broadway, Albany 1, New York						
Albany Rte. 9W	FASH 61-24 FARC 61-157	Delmar By-Pass Part 1 (Elm Ave. to Route 9W) Albany-Bethlehem Center, S.H. 5499 Proj. U-1129(2)	4.18 (2.28 Acc.)	9″ Cement Conc. Pavt., 2 @ 24′ Var.=3.76 Mi.; Asphalt Conc.=2.53 Mi.; Misc. Work=0.17 Mi. H.G.S. Comp. I-Beam	$225,000 Plans $5	$3,897,000
Greene Rte. 23	FARC 61-149	Cairo-Windham, Part 3, S.H. 8053; Cairo-Windham, Part 2, S.H. 5462. Proj. F-1159(5)	4.55	Asphalt Conc.=4.51 Mi. Misc. Work=0.04 Mi.	$90,000 Plans $5	1,662,000
Rensselaer Rte. 7	RC 61-152	Troy-Brunswick, Part 2, S.H. 25	0.08	Rock Removal	$850 Plans $5	15,000
Washington Rte. 22	FARC 61-154	Whitehall Village: Canal & Broad Sts., S.H. 5531; Whitehall-Dresden Center, Part 1, S.H. 5578; South Bay Bridge, S.H. 9113; Whitehall-Dresden Center, Part 2, S.H. 5637A; Whitehall-Dresden Center, Part 3; Dresden Center-Dresden Station, S.H. 8132; Dresden Station-Putnam, S.H. 8225. Proj. F-371(6)	10.56	Asphalt Conc.=10.16 Mi. Misc. Work=0.13 Mi. Constructing Causeway=0.27 Mi.	$235,000 Plans $5	4,273,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Montgomery	U.S. 106	Lock 14-E, Erie Canal, Canajoharie	....	New Gates; Lowering Sills; Misc. Work	5% of Bid Plans $10	Estimate Confidential
Oneida Madison	M 61-15	Durhamville Aqueduct Over Oneida Creek City of Oneida	....	Rehabilitation of Aqueduct	$2,600 Plans $5	50,000
DISTRICT No. 3, E. E. Towlson, District Engineer, 333 E. Washington Street, Syracuse, New York						
Cayuga Rte. 90	FARC 61-155	Locke-Homer Part 1, S.H. 9089 Proj. F-675(3)	8.73	Asphalt Conc. Type 1A	$65,000 Plans $5	1,187,000
Onondaga (Int. Trg. Rte. 81 & Rte. 11)	FISH 61-21	Interstate Route 505 (Nedrow to Syracuse City Line) Syracuse-Lafayette, S.H. 5365 Proj. I-81-2(65)	3.28 (1.61 Acc.)	9″ Cement Conc. Pavt. 2 @ 24′ Var.=3.03 Mi.; Asphalt Conc.=1.62 Mi.; Misc Work=0.24 Mi.; 2 Hgs Comp. I Beam & Plate Gird.; 1 Hgs Comp. I Beam	$140,000 Plans $10	2,572,000
DISTRICT No. 6, Wm. J. Dennis, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany Rte. 408	FARC 61-153	Friendship-Belmont, S.H. 5341 Proj. F-294(4)	4.73	Asphalt Concrete	$31,000 Plans $5	564,000
Allegany Rte. 408	FARC 61-156	Cuba-Friendship, S.H. 5174 Cuba-Friendship Part 2, S.H. 5312 Proj. F-326(4); F-294(2)	2.79	8″ Cement Conc. Pavt. 24′ Var.=2.70 Mi. Misc. Work=0.09 Mi. Twin Reinf. Conc. Box Bridge	$55,000 Plans $5	1,007,000
Schuyler Rtes. 14 & 414	TC 61-6	Watkins Village-Franklin St., S.H. 5335 Watkins-Bennettsburg, S.H. 5295	....	Eight Traffic Signals	$6,500 Plans $5	119,000
DISTRICT No. 8, M. N. Sinacori, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Putnam	FASS 61-14	Milltown Road, CR No. 504 (Bridge and Approaches) Proj. S-611(1)	0.10	Asphalt Concrete Comp. I-Beam Bridge	$6,000 Plans $5	106,000
Rockland	FASS 61-5	New City-Congers, County Rd. (Main St. to Brewery Rd.). Proj. S-311(3)	0.72	Asphalt Concrete	$19,000 Plans $5	332,000
Westchester	SBP 61-1	Sprain Brook Parkway Tuckahoe Rd. to Jackson Ave.	2.60 (3.45 Acc.)	8″ Cement Conc. Pavt. 2 @ 36′ Var.=3.19 Mi.; Asphalt Conc.=2.80 Mi.; Misc. Work=0.06 Mi.; Reinf. Conc. Closed Box Culvert. Hgs WF Comp. Beam; Conc. Retaining Wall	$230,000 Plans $5	4,103,000
Westchester	TSP 61-1	Taconic State Parkway Realignment Through Mohansic Park (Baldwin Road to Crompond Road)	2.58 (2.49 Acc.)	8″ Cem. Conc. Pavt.=3.95 Mi.; Asphalt Concrete=0.85 Mi.; Misc. Work=0.27 Mi.; 2 Hgs Reinf. Conc. Rigid Frame	$200,000 Plans $5	3,573,000
DISTRICT No. 10, A. M. Sarr, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx (Int. Trg. Rte. 87)	FIMDE 61-1	Int. Route Conn. 512 Major Deegan Expwy.—Contract 20 (Park Ave. to New York City Line) Proj. I-87-1(7)	7.48	Center Mall Barrier and Misc. Work	$18,000 Plans $5	322,000
Nassau	FANE 61-2	Nassau Expwy. Cont. 3 (Burnside Ave. to Central Avenue). Proj. U-1098(7)	0.88	Demolition of Buildings	$1,800 Plans $5	33,000
Nassau	WSP 61-1	Wantagh State Pkwy. Ext. (Northern State Pkwy.-Jericho Turnpike)	....	Demolition of Buildings	$225 Plans $5	4,000
Suffolk	FALIE 61-5	Long Island Expwy., Cont. 13 Islip Ave. (Caleb's Path) to Veterans Memorial Highway Proj. F-862(36)	2.85 (4.77 Acc.)	9″ Cem. Conc. Pavt.=3.36 Mi.; Asphalt Concrete=4.07 Mi.; 2 Hgs. Twin Comp. WF Beam Bridges; 2 Hgs Comp. WF Beam Bridges; Misc. Work=0.19 Mi.	$260,000 Plans $10	4,523,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: November 16, 1961

New York State Road Work

NOTICE TO CONTRACTORS: THE NEW YORK STATE BRIDGE AUTHORITY, BRIDGE PLAZA, POUGHKEEPSIE, N. Y. Pursuant to the provisions of the Highway Law, and Article 3, Title 2 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 16th day of November 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of said Authority, for the following project: M. N. Sinacori, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y. ORANGE COUNTY.

NAME OF PROJECT & MILES	DEPOSIT FOR PLANS	BID DEPOSIT	ENGINEER'S EST.
NBB. 61-3 Newburgh Beacon Bridge over Hudson River, Cont. 4 Interstate Rte. 503 Newburgh Approach Roadway 0.50(0.10 Acc.) Miles	$5.	$45,000.	$842,000.00

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, New York, and at the office of the District Engineer, noted above, and at the office of the State Department of Public Works, 270 Broadway, New York City, and may also be seen at the New York State Bridge Authority Office at Mid Hudson Bridge Plaza, Poughkeepsie, N. Y.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned to the Bureau of Contracts in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications.

Proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the NEW YORK STATE BRIDGE AUTHORITY for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, and Public Authorities Law, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS
FOR
NEW YORK STATE BRIDGE
AUTHORITY
DR. JOHN L. EDWARDS
CHAIRMAN

Bids: November 2, 1961

New York State Road Work
Interstate Routes 570 & 571

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Eastern Standard Time, on November 2, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 570, ERICKSON STREET TO EAST SYRACUSE, NEW PROJECT NO. 1-690-3(1)214 AND INTERSTATE ROUTE 571, DeWITT TO COLLAMER, NEW PROJECT NO. 1-281-2(50)84, ONONDAGA COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-187.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Earle E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made only in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $42,625.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $2,250.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

READ THE OFFICIAL
PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

Many contractors depend
entirely upon the
OFFICIAL PROPOSAL
COLUMNS
of
Engineering News-Record
for Opportunities to bid.
They might not see your announcements if printed elsewhere.

You undoubtedly want their bids on your contracts. Make sure of them on your next contract.

The cost is only $2.70
a line per issue.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. DC-5684) will be received at Huron, South Dakota, until 10 a.m. Central Standard Time, November 28, 1961, for furnishing labor and materials for Eagle Butte, Martin, Maurine, Mission and Newell Substations, Transmission Division, South Dakota, Missouri River Basin Project. Location near Eagle Butte, Martin, Maurine, Mission and Newell, South Dakota. Principal items are Lump sum—Designing, furnishing and installing all materials and equipment and constructing the five substations; and other work. Completion time 195 days for Maurine and Newell Substations; 225 days for Eagle Butte Substation; and 525 days for Mission and Martin Substations. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 825, Huron, South Dakota; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5686) will be received at Klamath Falls, Oregon, until 10 a.m. Pacific Standard Time, November 21, 1961, for furnishing labor and materials for earthwork and structures for laterals and drains, Klamath Project. Location near Tule Lake, California. Principal items are 414,000 cu. yds. excavation for laterals and drains; 50,000 cu. yds. excavation for leveling existing lateral; 17,000 cu. yds. compacting embankments; 4,700 cu. yds. excavation for structures; and other work. Completion time 390 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; P. O. Box 312, Klamath Falls, Oregon; or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids from Small Business Concerns for window replacement at 128 N. Broad Street, Philadelphia, Pa. Project No. 00919 will be received until 2:00 P.M. E.S.T., November 13, 1961; and then publicly opened. Bidding material may be obtained from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., from the custodian of the building where the work is to be done or from the Chief, Philadelphia Field Office, D&C Division, PBS., Rm. 902 U. S. Custom House & Appraisers Stores, 2nd and Chestnut Streets, Philadelphia 6, Pa.

INVITATION FOR BIDS: Sealed bids, in triplicate, will be received at the office of the Regional Director, CFA, Housing and Home Finance Agency—OA, Room 805, 346 Broadway, New York 13, New York until 2:00 o'clock p.m. (E.S.T.), on the 9th Day of November 1961 and then publicly opened and read aloud for furnishing all labor and material and performing all work for the construction of a Junior High School building at Otis AFB, Falmouth, Massachusetts. (Housing and Home Finance Agency Project No. 62-C-FED-4-A12) including General Construction, Heating and Ventilation, Plumbing, Electrical Work and Fixtures and Site Work. The Instructions to Bidders, Form of Bid, Form of Contract, General Conditions, Specifications, Plans, Form of Bid Bond, Performance and Payment Bond may be examined at the office of the project Architect, Korslund, LeNormand & Quann, Inc., 506 Washington Street, Norwood, Massachusetts, and one copy thereof obtained at said office upon deposit of $15.00 for a complete set of documents to be refunded upon receipt of each set of plans and specifications returned in acceptable condition within fifteen days after the date of award of contract. Such deposit shall be in the form of a certified check, bank cashier's check or postal money order, made payable to the Housing and Home Finance Agency—OA. Additional copies may be obtained upon payment of $40.00 per set. The fee for additional sets will not be refunded.

RICHARDSON J. THOMPSON,
ACTING REGIONAL DIRECTOR
COMMUNITY FACILITIES ACTIVITIES

Contractors Watch
This Section—
for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

Bids: November 14, 1961

New Jersey Turnpike Authority

CONTRACT NO. R-106

Proposals are invited for Contract No. R-106 which involves the furnishing and installing of 104,000 linear feet of buried cable and related station installations and appurtenances for seven (7) routes along the New Jersey Turnpike in Burlington, Middlesex, Essex, Union and Hudson Counties, New Jersey.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 o'clock, Eastern Standard Time, on the morning of November 14, 1961, at which time and place said proposals will be publicly opened and read.

Contract documents may be examined during office hours on or after October 23, 1961, at the office of the Authority, and will be furnished upon payment of Ten Dollars ($10.00) for each set, not refundable.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman
October 16, 1961
R-106

Bids: November 10, 1961

Delaware River Port Authority of the Commonwealth of Pennsylvania and the State of New Jersey

Administration Building
Camden, New Jersey

BENJAMIN FRANKLIN BRIDGE
CONTRACT NO. 32-A—
GENERAL CONSTRUCTION WORK
CONTRACT NO. 32-C—
PLUMBING WORK
CONTRACT NO. 32-D—
HEATING, VENTILATING AND AIR CONDITIONING
CONTRACT NO. 32-E—
ELECTRICAL WORK

Sealed bids will be received on the following four (4) Contracts for the Work of Alterations and Additions to the Administration Building, Northwest Corner of Linden and Sixth Streets, Camden, New Jersey.

Contract No. 32-A—
GENERAL CONSTRUCTION WORK
Contract No. 32-C—
PLUMBING WORK
Contract No. 32-D—
HEATING, VENTILATING AND AIR CONDITIONING
Contract No. 32-E—
ELECTRICAL WORK

at the office of the Director of Engineering of the Delaware River Port Authority, Administration Building, Benjamin Franklin Bridge Plaza, Camden, New Jersey, until 12:00 Noon, **Eastern Standard Time, Friday**, November 10, 1961, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for the bidders is given in the Contract Documents and Specifications for these Contracts, which may be obtained upon deposit of $25.00 per set. Deposits will be refunded by the Authority to anyone submitting a bid (limit $50.00 for 2 sets) if the Plans and Specifications are returned in good condition within ten days of the date of receipt of bids. Deposits will under no circumstances be refunded to individuals or companies not submitting bids.

Each proposal must be accompanied by a certified check:

For Contract No. 32-A—
GENERAL CONST. WORK...$25,000
For Contract No. 32-C—
PLUMBING WORK ....$ 2,000
For Contract No. 32-D—
HEATING, VENTILATING
AND AIR CONDITIONING...$ 2,000
For Contract No. 32-E—
ELECTRICAL WORK

This certified check should be made payable to the Delaware River Port Authority and be drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, together with a financial statement and a list of comparable work successfully completed, all of which must not be enclosed with the sealed bid but handed in separately. The surety's consent must be shown. The bidder to whom the Contract is awarded will be required to furnish a Performance and Labor and Materialman's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids and to award the Contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
C. H. McWILLIAMS
10/16/61 SECRETARY

Bids: November 15, 1961

Zipaquira Thermal Electric Plant Unit No. 2
Empresa De Energia Electrica De Bogota

NOTICE TO MANUFACTURERS

The Empresa de Energia Electrica de Bogota will accept proposals for furnishing and delivering FAS Ocean Port a boiler and turbine generator, and auxiliary equipment, in accordance with the following specifications for Unit No. 2 of the Zipaquira Thermal Electric Plant:

1) Specification 2957 for one (1) 33,000 KW Steam Turbine and auxiliary equipment consisting of the following principal items of equipment:
   a) 33,000 KW ASME AIEE Preferred Standard Steam Turbine Generator with direct connected exciter.
   b) Surface Condenser.
   c) Five (5) feedwater heaters, including deaerator.
   d) Evaporator with deaerating Preheater.

2) Specification 2958 for one (1) Steam Generating Unit consisting of the following principal items of equipment:
   a) One (1) Steam Generating Unit to generate 310,000 lb. of steam per hour with a superheater outlet pressure of 900 psig, and a final total temperature of 900°F from feedwater at 400°F.
   b) Coal pulverizing and oil burning equipment.
   c) Forced and induced draft fans.
   d) Dust Collector.
   e) Gas and air ducts.
   f) Supporting steel.

Prompt delivery of this equipment is essential and will be taken into consideration in evaluating the proposals.

Copies of these specifications will be available from the offices of The J. G. White Engineering Corporation, 80 Broad Street, New York 4, N. Y., at a price of $50.00 per copy of each specification.

Proposals for furnishing this equipment must be submitted to Empresa de Energia Electrica de Bogota c/o The J. G. White Engineering Corporation, Agent, not later than November 15, 1961.

Bids: November 21, 1961

The Port of New York Authority

GEORGE WASHINGTON BRIDGE
LOWER LEVEL EXPANSION
NEW YORK APPROACH
EMERGENCY GARAGE
CONTRACT GWB-190.013

Sealed proposals for the sale of materials and performance of Work for the construction of an emergency garage in New York City for the lower level expansion of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, November 21, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, October 26, 1961

Bids: November 21, 1961

The Port of New York Authority

TETERBORO AIRPORT
POLICE TRAINING FACILITY
CONTRACT TA-290.001

Sealed proposals for construction of a police training facility at Teterboro Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, November 21, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, October 26, 1961

Bids: November 1, 1961

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, New York, as follows:

Until 11 A.M. Wednesday, November 1, 1961

For Narrows Bridge Contract No. NB-11, Staten Island Approach and Plaza, Staten Island, New York City. The bid must be accompanied by a deposit in the amount of $250,000.00.

The contract includes grading, drainage, concrete and steel structures and paving.

Plans, specifications and contract documents may be purchased at the office of the Authority for $100.00 which will not be refunded.

OFFICIAL PROPOSAL

RATE: $2.70 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Class Adv. Div., Engineering News-Record, P. O. Box 12, New York 36, N. Y.

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Subject to Agency Commission.

**NOVEMBER 9TH
ISSUE
CLOSES
OCTOBER 27TH**

UNDISPLAYED RATE

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take 1/2 of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36

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*ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.*

• POSITIONS VACANT

Graduate Engineer with at least 1 year experience in electronic computer programming and/or application for Computer Section of large consulting engineering firm presently using Bendix G-15 Computer. Permanent employment with liberal benefit program. Reply with resume to Stanley Engineering Company, Muscatine, Iowa.

Civil Engineer, min. 5 yrs irrigation and/or hydroelectric experience. Overseas assignment with expanding consulting firm. Send resume and salary desired. P-7577, Engineering News-Record.

Wanted—Civil Engineer—Capable of designing storm sewers, paving, planning, inspection and miscellaneous other county work. Minimum 5 years experience in county highway or municipal work. College graduate or equivalent. Send resume and state salary required. Apply—Personnel Assistant, Anne Arundel County Commissioners Courthouse, Annapolis, Maryland.

Process Piping Engineer for full or part time work. Telephone—CO 2-5005 Paramus, New Jersey.

Estimator — Experienced for general contractor specializing in commercial, light-heavy industrial construction. Please send resume, photo and vital statistics—Location Mid-South—salary and percentage. All replies confidential. P-7656, Engineering News-Record.

Pipe fitter foreman. Experienced in Steam and Air Conditioning Piping. Metropolitan N. Y. area. P-7642, Engineering News-Record.

Engineer of Public Works for City of Huntsville, Alabama. Experience required in municipal or related work. Registration required State of Alabama. Reply to Councilman C. H. Cummings, Jr., P.O. Box 57, Huntsville, Alabama.

Assistant City Engineer—Prepares plans and specifications for city projects and supervises construction valued at $3 million per year. Helps supervise 15 man engineering staff. Experienced in responsible major civil engineering work and eligible for Wisconsin P.E. Contact Personnel Department, Room 17 City Hall, Kenosha, Wisconsin.

Wanted: Expert Tunnel Supt. Give qualifications and references. P-7650, Engineering News-Record.

Permanent openings for young Graduate Civil Engineers with Materials Department of a Midwestern State Highway Commission. Reply P-7667, Engineering News-Record.

Field Engineer — Permanent position with established Midwest consulting firm for man thoroughly qualified and experienced in all branches of building construction. Moving expenses paid. Electrical or process engineer preferred. Send complete resume to P-7633, Engineering News-Record.

Guard Rail Superintendent. Must be familiar with all phases of guard rail construction and be able to procure and train capable foremen and operators. Send complete resume including salary requirements to P-7614, Engineering News-Record.

• POSITIONS VACANT

Water Works Engineer—Graduate with degree in Sanitary Engineering, or Chemistry, for water works management company; 5-10 years experience in investigation, design and supervision of purification facilities. Location: Philadelphia, Pa.; some travel. P-7700, Engineering News-Record.

Highway Engineers and Structural Designers. Experienced. Send resume and salary requirements. Frederic A. Nassaux & Assoc., 312 Trust Bldg., Chambersburg, Penns.

Electric Systems Engineer—Midwestern consulting engineering firm has challenging opportunity in electric systems planning. Work includes network analyzer, sectionalizing and economic feasibility studies. Permanent employment offered to man with 3 to 5 years experience. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Civil Engineer, graduate or registered. Experienced in field control of highway construction and materials. Complete chronological resume requested. Salary appropriate to age and experience. P-7661, Engineering News-Record.

C.P.A.—Years of experience in construction and taxes. Must be top man for top, steady position. P-7712, Engineering News-Record.

Civil Engineer with preference for either Highway Engineering or Sanitary Engineering but willing to participate in related civil engineering projects. Location Midwest. Moderate size consultant. P-7698, Engineering News-Record.

Draftsmen, Structural-Experienced checkers and detailers of structural steel shop dwgs. Relocation expenses. Fink and Zwecker Co., 1100 Crescent Ave., N.E., Atlanta 9, Ga.

EMPLOYMENT SERVICES

"NER" describes hundreds of $7,000-$35,000 Executive job openings monthly. Write for free copy. National Employment Reports, 105 W. Adams, 830-B, Chicago 3.

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 50 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 659 Brisbane Bldg., Buffalo, N. Y.

• POSITIONS WANTED

C.E., over 6 yrs. exp.: structural design, swrs & water lines, estimates, super. of construction, programming IBM-650. Available. Will relocate. J.S. 75-A Iozzia Ter. E. Paterson, N. J.

Reinforcing detailer with five years experience. One year of estimating. PW-7654, Engineering News-Record.

Civil Engineer, Registered, 33, married, employed—9 yrs industrial water engineering, hydrology, hydraulics, drainage, water treatment, waste disposal, water well drilling and testing, public relations, min. $10,500. PW-7664, Engineering News-Record.

Diligent, Aggressive Construction Super. Age 40, B.S.C.E., 13 yrs. all phases gen. const. including 7 yrs. foreign in S.A. and Orient. Seeks 2 yr. foreign assign. Prefer S.A. but consider other areas. Good Spanish. Resume on request. PW-7648, Engineering News-Record.

• POSITIONS WANTED

Senior Registered Civil Structural Engineer. Eleven years broad experience in plant engineering, preventive maintenance programs, industrial and communication structure design. Resume on request. PW-7674, Engineering News-Record.

Executive Hydraulic Dredge Civil Engineer desires connection with dredge firm or dredge owner. Full time, project or consultation basis. Over 25 years experience dredge management, field investigation, cost estimates. No family, location immaterial. PW-7657, Engineering News-Record.

Construction Superintendent — 25 years experience, buildings, dams, airports, docks, steel mills, fuel storage tanks and pipe lines, including repair work, structural steel erection rigging, pile driving, forms, concrete. PW-7611, Engineering News-Record.

Engineer with proven construction management ability. Major experience in supervision lump sum government contracts to $10 million size. Missile base construction experience. Graduate PE. Age 36. PW-7610, Engineering News-Record.

Chief Engineer available soon. Graduate and Registered with 14 years contractors experience in estimating and management of commercial, highway, and heavy construction. Resume sent upon request. PW-7581, Engineering News-Record.

Chf. Estimator—15 yrs. experience in Heavy Construction. BSCE, P.E. Roads, bridges, dams, airports, utilities. Metropolitan New York only. PW-7639, Engineering News-Record.

Estimator and Construction Engineer, BSCE. 22 years experience in all phases of construction including 4 years mechanical. PW-7596, Engineering News-Record.

Purchasing Agent—20 years experience buying construction materials, equipment, negotiating and placing sub-contracts, compiling contract bids, controlling project costs. PW-7719, Engineering News-Record.

(Continued on opposite page)

*"Put Yourself in the
Other Fellow's Place"*

TO EMPLOYERS
TO EMPLOYEES

Letters written offering Employment or applying for same are written with the hope of satisfying a current need. An answer, regardless of whether it is favorable or not, is usually expected.

MR. EMPLOYER, won't you remove the mystery about the status of an employee's application by acknowledging all applicants and not just the promising candidates.

MR, EMPLOYEE you, too, can help by acknowledging applications and job offers. This would encourage more companies to answer position wanted ads in this section.

**We make this suggestion in a spirit of helpful cooperation between employers and employees.
This section will be the more useful to all as a result of this consideration.**

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., INC.

330 West 42nd St., New York 36, N. Y.

• *POSITIONS WANTED*
(Continued from opposite page)

Alert—Family—Hungry—13 years experience Estimating, Administrative-Constr. Supervision & Inspection. Locate anywhere USA. PW-7695, Engineering News-Record.

Field Eng: BSCE-35-10 yrs. diversified exp. heavy construction, soils, photogrammetric control surveys, subdivisions, land surveying, and mining engineering. Desire affiliation with consulting engineering firm or land surveyor on salary or partnership basis. Enjoy challenge, responsibility and balance of field and office work. References and resume on request. PW-7691, Engineering News-Record.

Mechanic—Age 25—10 years experience on Allis Chalmers, Caterpillar, G.M. Diesel and Welding experience. PO Box 165, Bergen, N. Y.

Highway Design Engineer P.E. ten years experience in all phases of State & Interstate highway design, Urban & Rural. Wishes position with consulting firm Midwest or East. PW-7711, Engineering News-Record.

Engineer, Plant Project. M.E. 36. 7 yrs. refinery, 1.5 yrs mining & refining, 5 yrs potash borax extraction. Cost & progress reports, contracts, design, development, specifications, selection, evaluation. Piping terminals, tankage, acid & sulfur plants, structures. PW-7717, Engineering News-Record.

Layout Eng. or party chief-clerk of works, diversified expr., will travel, location immaterial—single. PO Box 949, Hollywood, Fla.

BSCE, age 30, 5 yrs exp. as field construction supervisor for public utility. Exp. in constr. of power houses, commercial bldgs. Inspection, scheduling, coordinating, expediting, estimating, design. Prefers location eastern states. PW-7689, Engineering News-Record.

Structural Engineer—M.S., Prestressed Concrete manufacturer. Experienced in production, design, estimating, general supervision. Construction background. PW-7716, Engineering News-Record.

General Manager—Reg. PE, for med. or small contracting or engineering firm, 35 years diversified domestic and foreign exp. Available for an interesting connection. PW-7703, Engineering News-Record.

B.S.C.E. Age 24, single, military obligation complete. Desires field work in construction or petroleum industry in Latin America. 2 years field experience in construction. PW-7693, Engineering News-Record.

N.Y.-P.E. L.S. 30 yrs. responsible design & construction experience, seeks active interest in established organization. Invest $25M or more. PW-7686, Engineering News-Record.

Structural Designer: Experienced in heavy steel and concrete structures as railroad, petroleum refineries, copper mine, and railroad bridges. Some highway bridge work. Graduate engr. Prefer So. Cal. or Gulf States. Consider other. PW-7692, Engineering News-Record.

Chief Estimator, graduate civil engineer, 38. Excellent field experience from field engineer to project manager. PW-7715, Engineering News-Record.

NOTICE to ADVERTISERS

Because of the Holiday, Election Day, November 7th, the "Searchlight" pages of the

November 9th Issue of

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

Display and Undisplayed Ads

FINAL CLOSING TIME

Friday, October 27th

PROPOSALS

Thursday, November 2nd

Florida calling
A TOP MECHANICAL ENGINEER

This is **THE** job for a successful, graduate, mechanical engineer of executive managerial caliber. Must be an experienced estimator who can also organize and supervise the project after his bid wins it. Must also know sub-contractor negotiations. This is a top job for a top man who probably wouldn't consider making a change **EXCEPT** for the unlimited opportunity of the job, and living in sunny Miami all year round. Salary well into five figures. Write full details in complete confidence to:

MARKOWITZ BROS., INC.
MECHANICAL CONTRACTORS
5600 Northeast 4th Avenue, Miami, Florida

Established in Miami since 1925
Offices in Washington, New Orleans, Atlanta, Madrid

• AIR CONDITIONING • PLUMBING • HEATING • POWER PLANTS
• PROCESS PIPING • SEWAGE AND WATER TREATMENT PLANTS

Highway Designers

Large Midwest consulting engineering firm has permanent employment for qualified engineers with minimum of three years experience in highway design. Salary commensurate with ability and experience. Real opportunity with this expanding firm. Send complete resume to

P-7704, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

THERMAL POWER STATIONS
PROJECT SUPERINTENDENTS
ASSIST. PROJECT SUPERINTENDENTS
Civil—Mechanical—Electrical
START AND TEST ENGINEERS
SHIFT OPERATORS
LOCATION FAR EAST
Qualified applicants submit resume to
THE KULJIAN CORPORATION
Construction Division—Dept. E
1200 N. Broad St.—Philadelphia 21, Pa.

CHIEF HIGHWAY ENGINEER

Midwest Consultant is desirous of obtaining an experienced engineer capable of administering a staff of fifty. This is a permanent position with generous fringe benefits. Send resume and salary requirements to:

Box P-7627, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

EMPLOYMENT PROBLEM?

When you are in need of specialized men for specialized jobs, contact them through an employment ad in this publication.

BECHTEL

San Francisco

Power and Industrial Division offers immediate employment opportunities for electrical, mechanical, or structural engineers capable of assuming responsibility on design of major steam or hydro power plants.

Relocation allowances cover moving costs plus transportation reimbursement for you and members of your family. If you have an interest in a San Francisco assignment, please send a resume of experience to W. A. Anderson, Technical Recruiting. Personal interviews will be arranged for qualified candidates.

Bechtel
Corporation
220 Montgomery Street
San Francisco, Calif.

In New York City, a personal interview can be arranged by phoning Edmund J. Orr, MUrray Hill 7-7100

SEARCHLIGHT SECTION CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

DISPLAYED RATES

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vert. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.70 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

PRICES REDUCED

10—Model DW20 Caterpillar Pneumatic Tired Tractors with modified Cat. 456 P Scrapers. These are **67C** series serials.

Old Price .... $27,000.00 ea.
Revised Price .... 19,800.00 ea.

19—Model DW20 Caterpillar Pneumatic Tired Tractors with modified Cat. 456 P Scrapers. These are **88E** series serials.

Old Price .... $30,000.00 ea.
Revised Price .... $23,750.00 ea.

THE 88E SERIES ARE F.O.B. OROVILLE, CALIFORNIA

FINANCING AVAILABLE TO USERS!

GUY F. ATKINSON COMPANY
10 West Orange Avenue So. San Francisco, Calif.
***PHONE:* PLAZA 6-0300, EXT. 279**

FOR SALE! Bargains!

Three Mobile Single Pass Crushing Plants.

Used—Gruendler SP-63 Portable Single Pass Crushing Plant with Diesel Power, Reciprocating Plate Feeder, Gruendler 3XC Impact Crusher and 30" Delivery Conveyor for truck loading. Ideal for lime stone or wet coral rock. Capacities depending on size product wanted—50 to 100 tons hourly. IMMEDIATE DELIVERY!

New—Gruendler SP-63 Portable Single Pass Crushing Plant. DELIVERY IN OCTOBER!

Rebuilt like new—Gruendler SP-64 Portable Single Pass Crushing Plant. Capacity, 150 to 200 tons hourly. New machine warranty. PROMPT DELIVERY!

Above equipment SUBJECT TO PRIOR SALE! Write us for their location and for inspection.

GRUENDLER CRUSHER & PULVERIZER CO.
2917 N. Market St., St. Louis 6, Mo.

FOR SALE

Ten (10)—Caterpillar D8's

late 2U Series, with Johnson Bars, perfect bottoms, perfect clutches, hydraulic caterpillar blades and system. Not a weld in any machine.

JULIUS HEBENSTREIT, INC.
56-15 58th Street, Maspeth, New York
Davenport 6-1461

18V PIONEER DUPLEX PORTABLE CRUSHING AND SCREENING PLANT

10" x 24" RB Jaw Crusher, 24" x 16" RB Roll Crusher, 30" x 8' 3½-Deck Screen, GMC diesel, pneumatic tires, excellent condition. New 1952.

DARIEN CORPORATION
60 E. 42nd St. New York, N. Y.
Telephone MU 2-0042 or MU 2-1898

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3 DRUM HOIST

New 3 drum hoist with swinger attached. Diesel power with torque converter. 18,000# line pull.

HAVRE DE GRACE SHIPYARD, INC.
Havre De Grace, Maryland

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8 Cu. Yd. CABLEWAY 100' Head Mast, 40' Traveling Tail Tower 3" x 1850' Roebling Lock Coil Main Cable. 500 H.P. Electric with all Controls and Accessories.

PACO
2911 E. Marginal Way South Seattle, Wash.

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USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service We will also *buy* your old instruments or take them in *trade*.

A complete line of Engineering Instruments and equipment for field or office. Write for catalog NRL 210.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

ALL MAKES

RE-BUILT
REPAIRS
RENT
REAL EXPERTS

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69 Dey St., New York WOrth 2-2797

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.

[illegible] without obligation

WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE, MASS.

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR
DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWERAGE PLANTS

FOR
SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

FOR SALE

IRVINGTON FORMS

4 CORNER PANELS—18 SIDE DROP PANELS—12 CENTER DROP PANELS—20 COLUMNS 18" x 20'-0"

Used twice—price $3500.00
Call Waynesboro 2370 or write
A. R. WARNER, INC.,
Waynesboro, Pa.

SEARCHLIGHT Equipment Locating Service

No Charge or Obligation

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment *not currently advertised*. (This service is for USER-BUYERS only.)

How to use: Check the dealer ads to see if what you want is not *currently* advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Section
Locating Service
Classified Advertising
c/o ENGINEERING NEWS-RECORD
P. O. BOX 12, N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

— — — — — — — — — — — — — — — — —

Searchlight Equipment Locating Service
Classified Advertising
c/o ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y.

Please help us locate the following equipment components.

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....
NAME ....
TITLE ....
COMPANY ....
STREET ....
CITY 10/26/61

HEAVY EXCAVATION EQUIPMENT

LARGE DRAGLINES, SHOVELS, CRANES,
ROTARY DRILLS, EUCLID DUMP TRUCKS

FRANK SWABB EQUIPMENT COMPANY, INC.
Hazleton National Bank Building, Hazleton Pa.
Phone GL 5-3658

PILING

SURPLUS NEW and USED
For Sale, Wanted or Rent

H & SHEET STEEL PILING

1400 PCS. BP8, BP10, BP12—BP14—55′ to 60′
3700 PCS. BETH. SP6A, 50′, 56′, 48′ & 40′ & 35′
1900 PCS. MP112—12′ 15′ 20′ 25′ 31′ 35′ & 60′
2800 PCS. BETH.—AP3 10, 15′, 20′, 25′, 30′ & 60′
2500 PCS. BETH.—DP2—20′, 25′, 30′, 35′, 40′, & 60′
1200 PCS. ZP38-ZP32—20′, 32′, 36′, 40′, 50′, 60′
600 PCS. ZP27—20′, 26′, 31′, 40′, 45′, 60′
500 PCS. 10′ & 15′ Corrugated Piling

PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
DETROIT—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS

DIESEL LOCOMOTIVES & CRANES

12—Gen. Elec. 100, 80, 70, 65, 45, 25 & 23 ton
40 Ton Amer. 60′ Boom Diesel Loco Crane
25 Ton Industrial Loco Crane 60′ Boom
690′ Chgo Pneu Elec. Air Comp. Type YCB 100 HP 440V Modern

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.
Telephone MU 2-3075 or MU 9-1898

Faster From Foster

STEEL-SHEET
PILING
H-BEARING PILE–PIPE–RAIL

L. B. FOSTER CO.
Pittsburgh 30 · New York 7 · Chicago 4 · Houston 2
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PIPE

Surplus New & Used
FOR SALE, WANTED OR RENT

Call: HYACINTH 7-4900

PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

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ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

STEEL PIPE

NEW — STRUCTURAL — RECONDITIONED
VALVES & ALL TYPE FITTINGS
COMPLETE FABRICATION FACILITIES

GREENPOINT PIPE SUPPLY CORP.
341 Stagg Street, Brooklyn 6, N. Y. EV. 6-7200

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE-POINTS AND SLEEVES
TIMBER SPLICERS AND SHOES
CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

Top Value Machines at Rock Bottom Prices

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2—Used TS-360 Allis-Chalmers, 15 cu. yd. Scrapers, good condition, tires good.

2—Used TS-300 Allis-Chalmers rubber-tired Scrapers, 14 yd. struck capacity. Good condition. 1955 machines.

•

1—Used Model 1600 (One Yard) Manitowoc Crane S/N 1633, complete with 95 ft. boom and 15 ft. jib, GM 4-71 diesel engine, tagline and fairlead.

1—Used Model 455 P&H (One Yard) Crane, 55 ft. boom combination clam, drag machine.

•

1—Used Minneapolis Moline Rubber Tired Loader 1½ yd.

1—Used TD-24 Int. Tractor (1955) with Push Block.

•

5—REBUILT TS 24
EUCLID TWIN ENGINE
RUBBER TIRED SCRAPERS

4—EUCLID 14TDT
SIX WHEELER RUBBER TIRED
15.5 CU. YD. SCRAPER

MOD. T-24 MICHIGAN
25 TOW TRUCK CRANE

Gil Boers
EQUIPMENT CO.

construction and rental machinery

SALES • RENTALS • SERVICE

7625 S. KEDZIE AVE.
CHICAGO 52, ILL.
PRospect 6-4000

FOR SALE
25 yd. Bucyrus-Erie Electric Dragline
WILLIAM LUBRECHT, III
CONSTRUCTION EQUIPMENT
311 W. Diamond Ave., Hazleton, Pa.
Telephone Gladstone 5-4041—5-0253

RAILS-TIES

TRACK ACCESSORIES

RAILS

MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.

RAILROAD Cross and Switch **TIES**

Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky
TW 5-9484

FOR SALE or RENT

200 TON AMERICAN 200-160 GUY DERRICK. 160′ BM. 180′ MAST. 20′ BULLWHL.
50 TON AMERICAN #3046 STIFFLEG DERRICK, 130′ BM. 45′ MAST. NEW 1956.
30 TON WILEY TYPE F STIFFLEG DERRICK 60′ BM.
20 TON AMERICAN STIFFLEG DERRICK 96′ BM.
200 HP AMERICAN #180 3D ELECTRIC HOIST & SWINGER. DYNAMIC BRAKES, AIR CONTROLS.
40 TON AMER. #408 DIESEL LOCOMOTIVE CRANE.
1500 HP ALCO DIESEL ELEC. LOCOMOTIVES
70 & 45 TON GEN ELEC. DIESEL ELEC. LOCOS.

WHISLER EQUIPMENT COMPANY
1905 Railway Exchange Bldg., St. Louis, Mo.

EUCLID
TWIN SCRAPER

1961 Model TS-14
Only 3 Months Use

LIKE NEW
LOW PRICE

L. B. SMITH, INC.
Court Street Road
Syracuse 6, New York
HE 7-2611

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

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Soil Mechanics Engineering Geology
Geophysics
Atlanta, Chicago, Honolulu, Houston, Los Angeles, New York, Portland, Salt Lake City, San Francisco, Seattle.

Goodkind & O'Dea

Consulting Engineers
Design and Supervision
Foundations, Structures, Highways
1214 Dixwell Ave. Hamden, Conn.
610 Bloomfield Ave, Bloomfield, N. J.
325 Spring Street, New York, N. Y.
108 W. Lake Street, Chicago 1, Ill.

Fay, Spofford & Thorndike, Inc.

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Industrial Plants Incinerators
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Bridges Express Highways
Port and Terminal Work Airports

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Electrical—Mechanical—Structural

Design and Supervision of Construction
-:- for -:-
Utility, Industrial and Atomic Projects

Surveys—Appraisals—Reports

Technical Publications
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Chas. T. Main, Inc.

Engineers
Design and Supervision of Construction for Industrial Plants—Electrical, Steam and Hydraulic Engineering—Investigations, Reports, and Appraisals.
Boston, Mass. Charlotte, N. C.

Metcalf & Eddy

Engineers
Soils, Foundations; Waterworks, Sewage Works, Drainage, Irrigation, Flood Control, Refuse, Industrial Wastes, Airports, Highways, Military Projects, Industrial and Commercial Facilities.
Statler Building, Boston 16,
Massachusetts

Moore Survey & Mapping Corp.

Engineers-Photogrammetrists-Surveyors
Geodetic Control—Construction Layout
Aerial Topographic Surveys—Tax Maps
Hydrographic Surveys—Photogrammetry
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Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
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Phone: REpublic 7-8131

Benjamin E. Beavin Company

Drainage, Water, Sewerage, Grading,
Soils & Geologic Engineering
Ports, Airfields, Highways, Structures
104 E. 25th St., Baltimore 18, Md.

Whitman, Requardt & Associates

Engineers—Consultants
Civil—Sanitary—Structural
Mechanical—Electrical
Reports, Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Ewin Engineering Corporation

Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Urban Renewal.

5104 MacArthur Blvd. N.W.
Washington, D. C.

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150 Savannah St. Mobile, Ala.

Baker-Wibberley & Associates, Inc.

Consulting Engineers
Civil, Sanitary, Structural,
Foundations, Soils
49 N. Jonathan St., Hagerstown, Md.
Baltimore, Md. Waynesboro, Pa.

Louis Berger & Associates

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Highways-Bridges-Dams-Airfields
Structures-Buildings-Industrial Plants
Military Installations-Foundations
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200 S. Main Street, Salt Lake City, Utah
1505 Delashmut Ave., Columbus 12, Ohio
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8 rue de Neuchatel, Geneva, Switzerland
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ENR-T4

Editorials

Taxes and Urban Growth

Real estate tax policy as an instrument for shaping urban growth gets intensive study in "Property Taxation and Urban Development," a monograph published by the Urban Land Institute, (1200 18th St. N. W., Washington 6, D. C.). To centralize city development and reduce the blight and inefficiency of urban sprawl, author Mary Rawson a Canadian land economist, urges a basic reform in the tax policy followed in most North American cities. Her proposal: Adopt a system successfully applied in Australia and New Zealand—tax land only, and exempt buildings and other improvements.

Present real estate policy, almost universal in this country, taxes land and improvements at the same rate. In the central city areas particularly, this policy produces an anomolous situation: Improve your property and increase the city's assets, and the city fines you in the form of higher taxes. Let your property decay and extend the city's blight, and the city rewards you with lowered taxes.

This practice, according to Miss Rawson, violates the "benefit-received" principle of taxation, and misapplies the "ability-to-pay" principle. She argues for the land tax as a sound principle of taxing a site for its potential value, which in turn would tend to promote its sound development.

Raising taxes on vacant and ill-used land, for example, would reduce its attractiveness to speculators whose unplanned, leapfrog developments contribute to the chaotic pattern of the exploding metropolis. Such developments also make city services more expensive, generate additional traffic congestion and make public transportation more difficult to plan.

On the positive side, eliminating the tax on improvements would stimulate building and repair of deteriorating structures. Existing tax abatement policies, designed to generate urban renewal and used extensively in New York City to encourage construction of non-profit housing, make use of this same general principle.

The nation needs all the tools it can get to combat the problems of the exploding metropolis. As essential as they are, urban renewal programs are no panacea; there is, and can be, no panacea for any problem so complex. Redistribution of real estate taxes, without violating any principles of equity, might well improve patterns of urban growth through the natural operation of free enterprise. Miss Rawson's provocative proposal is at least deserving of wide discussion.

Water Isn't Short; Vision Is

A lesson in perspective may be learned from a study of Texas water resources just completed by a U. S. Study Commission (ENR Oct. 19, p. 30). The body's encouraging report should clear up certain fanciful misunderstandings about the real reason for many water shortages, in Texas and elsewhere, and the best way to solve them.

Take, for example, the 1950-57 drought in Texas. It has been reported that citizens lined up in Dallas to buy water for 50 cents a gallon. That dramatically underscored a need for action. Unfortunately this and other striking demonstrations of lack of water were used not to promote the kind of action needed, but rather to help build a case for a big saline water purification program.

The Commission's findings point up the naivete of such an approach. The group reports plenty of water for at least the next 50 years in an eight-basin area incorporating 60% of the state's land area and containing 80% of its population. Furthermore, the Commission mapped the long-term construction program necessary to develop the water.

Many areas in this country have gone thirsty, relatively speaking, merely from failure to develop catchments, impoundments, transmission pipelines and distribution systems. Some areas are still thirsty and a few will remain so until they are forced in desperation to see that we don't have to wait for a scientific breakthrough to have water. There is no shortage of water—only of vision and energetic action.

ASCE Revamps Its Meetings

In a significant move, hailed by one speaker as its "most important development in decades," the American Society of Civil Engineers last week adopted a new policy on conventions (see also p. 21). Instead of the something-for-everybody and not-much-for-anybody programming all too prevalent in the past, every future national meeting of the Society, beginning next May, will be a conference on one of four general subjects: water resources, transportation, structures, environment.

It will work this way: Next May in Omaha, water resources will be the subject. Only those technical divisions with an interest in water resources projects will contribute (Construction, Waterways and Harbors, Hydraulics, Sanitary Engineering, Power, and Irrigation and Drainage). Similarly, in Detroit next autumn a transportation conference will bring together the Construction, Highway, City Planning, Air Transport, and Pipeline divisions. And so on.

The idea is sound although it may take a little shaking down. For example, the proposed "environment" conferences don't sound very strong. Grouping of Sanitary Engineering, City Planning, and Surveying and Mapping to confer on environment seems artificial. But time will tell. The important thing is that the framework is now available for meetings that can focus effectively and in depth on a single broad area of activity instead of only nibbling superficially at many.

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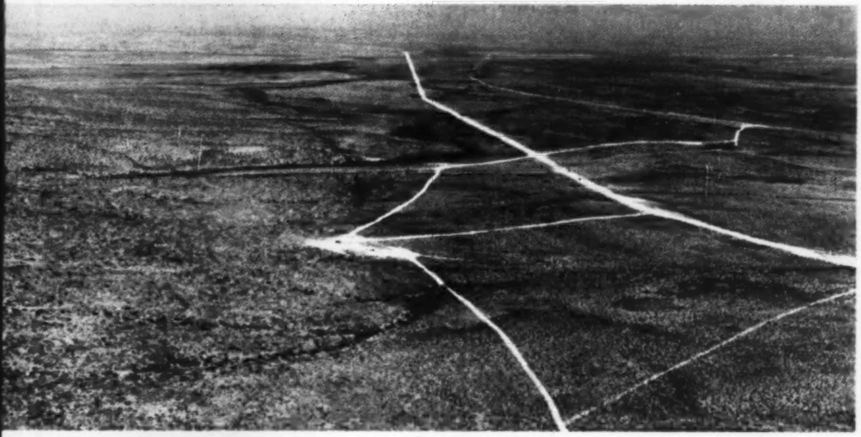

MAIN TRANSMISSION LINE of 33" American Concrete Cylinder Pipe extends 33,000 feet northward toward Carlsbad, just below the horizon. Portions of well-collector lines radiate from one of seven automatic pumping stations (white spot in center).

CREW PRECISELY ALIGNS 32-ft. lengths of 24" American Concrete Cylinder Pipe before joining sections. Installation of the 110,000 feet of gathering and transmission lines was completed substantially ahead of schedule.

PIPE LAYING CRANE easily and quickly joins spigot end of ACCP with bell end of previously laid section.

The City of Carlsbad, New Mexico has taken dramatic steps to meet the challenge of today before it becomes the problem of tomorrow. It can now boast a water system that will meet anticipated growth of industry and populace for the next fifty years without need for enlargement. This progressive city of 27,000 has wisely invested $2,500,000 to bring high quality water through a permanent pipeline system from a 200,000,000-year-old sandstone reef located seven miles away. Capitan Reef accumulates an estimated 60,000 acre-feet of natural recharge annually... clean, relatively soft water that will encourage industrial expansion.

The new pipeline system was specifically planned for the future, with 14" to 36" American Concrete Cylinder Pipe specified for all gathering and transmission lines. Although designed for gravity flow up to 32,000 gpm. the 150 psi line can be fully pressurized for substantially greater discharge whenever the City's growth warrants. It will never create a bottleneck in Carlsbad's water supply program!

In your plans for the future of your community, it will pay you to consult American Pipe and Construction Co., manufacturers of modern pipe for man's most ancient problem: WATER.

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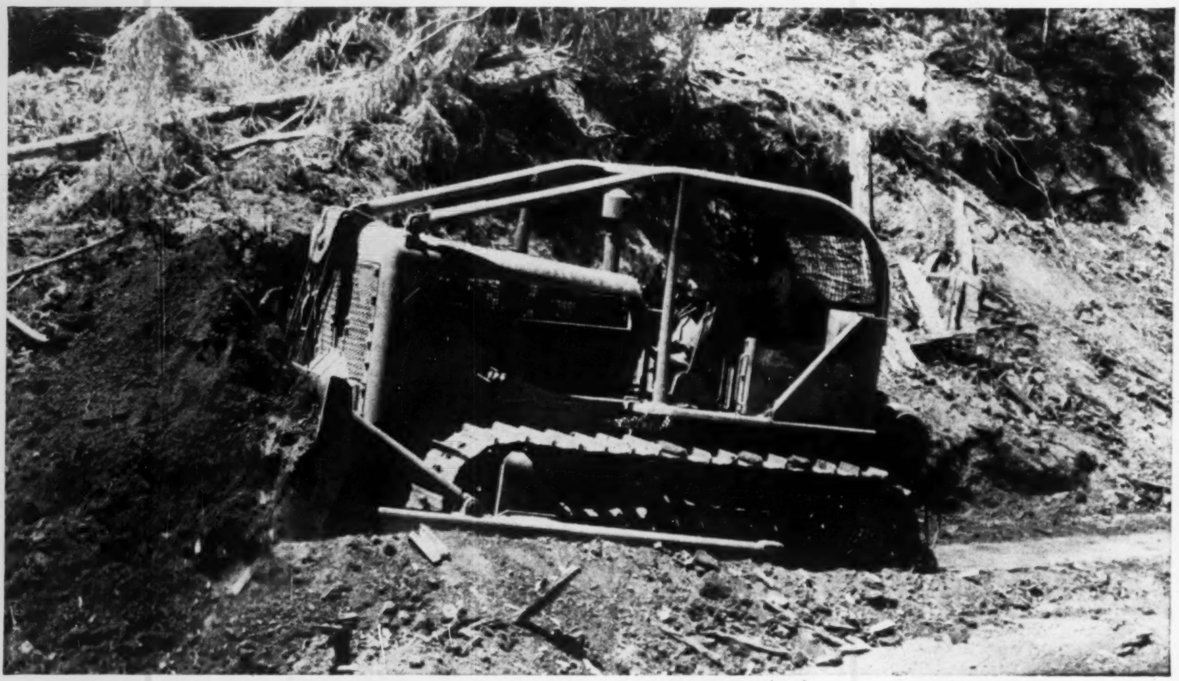
How Allis-Chalmers puts horsepower where it's needed—cuts contractors' costs



By keeping friction to a minimum in all moving parts of their compact HD-16, Allis-Chalmers engineers produced a machine that works right along side higher rated crawlers. The HD-16 heavy-duty model has 58 Timken® tapered roller bearings to practically eliminate friction in bevel gear and clutch shaft, final drive pinion, intermediate and sprocket shafts, track idlers, support rollers and truck wheels. The result is that more of its 148 horsepower is delivered to the tracks —*where it counts.*

By making the most of the available horsepower, with Timken bearings to roll the loads, Allis-Chalmers gives contractors more *work power*—enables them to use a compact, less expensive machine for the job, increase their profits.

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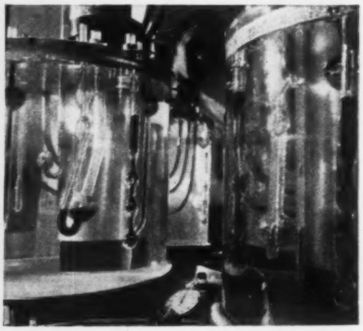
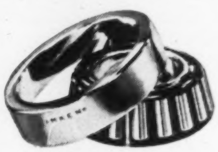


METALLURGICAL LAB develops the steels that will make tomorrow's Timken bearings last even longer, helps customers design more economically.



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